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BreezeACCESS-EZ

SU-A-EZ Manual

SU-A-EZ
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Document History

Topic	Description	Date Issued
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Electronic Emission Notices

This device complies with Part 15 of the FCC rules.

Operation is subject to the following two conditions:

1 This device may not cause harmful interference.

2 This device must accept any interference received, including interference that may cause undesired operation.

Radio Frequency Interference Statement

The SU-A-EZ Access Unit has been tested and found to comply with the limits for a class B digital device, pursuant to part 15 of the FCC rules and to EN 301 489-1 rules.These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a residential environment notwithstanding use in commercial, business and industrial environments. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications.

FCC Radiation Hazard Warning

To comply with FCC RF exposure requirement, the antenna used for this equipment must be fixed-mounted on outdoor permanent structures with a separation distance of at least 20 centimeters (8 inches) from al persons.

R&TTE Compliance Statement

This equipment complies with the appropriate essential requirements of Article 3 of the R&TTE Directive 1999/5/EC.

Caution

To avoid electrical shock, do not perform any servicing unless you are qualified to do so.

Line Voltage

Before connecting this instrument to the power line, make sure that the voltage of the power source matches the requirements of the instrument. The unit must be connected to an earthed (grounded) outlet to comply with international safety standards.

Radio

The instrument transmits radio energy during normal operation. To avoid possible harmful exposure to this energy, do not stand or work for extended periods of time in front of its antenna. The long-term characteristics or the possible physiological effects of Radio Frequency Electromagnetic fields have not been yet fully investigated.

Outdoor Unit and Antenna Installation and Grounding

Ensure that outdoor units, antennas and supporting structures are properly installed to eliminate any physical hazard to either people or property. Make sure that the installation of the outdoor unit, antenna and cables is performed in accordance with all relevant national and local building and safety codes. Even where grounding is not mandatory according to applicable regulation and national codes, it is highly recommended to ensure that the outdoor unit and the antenna mast (when using external antenna) are grounded and suitable lightning protection devices are used so as to provide protection against voltage surges and static charges. In any event, Alvarion is not liable for any injury, damage or regulation violations associated with or caused by installation, grounding or lightning protection.

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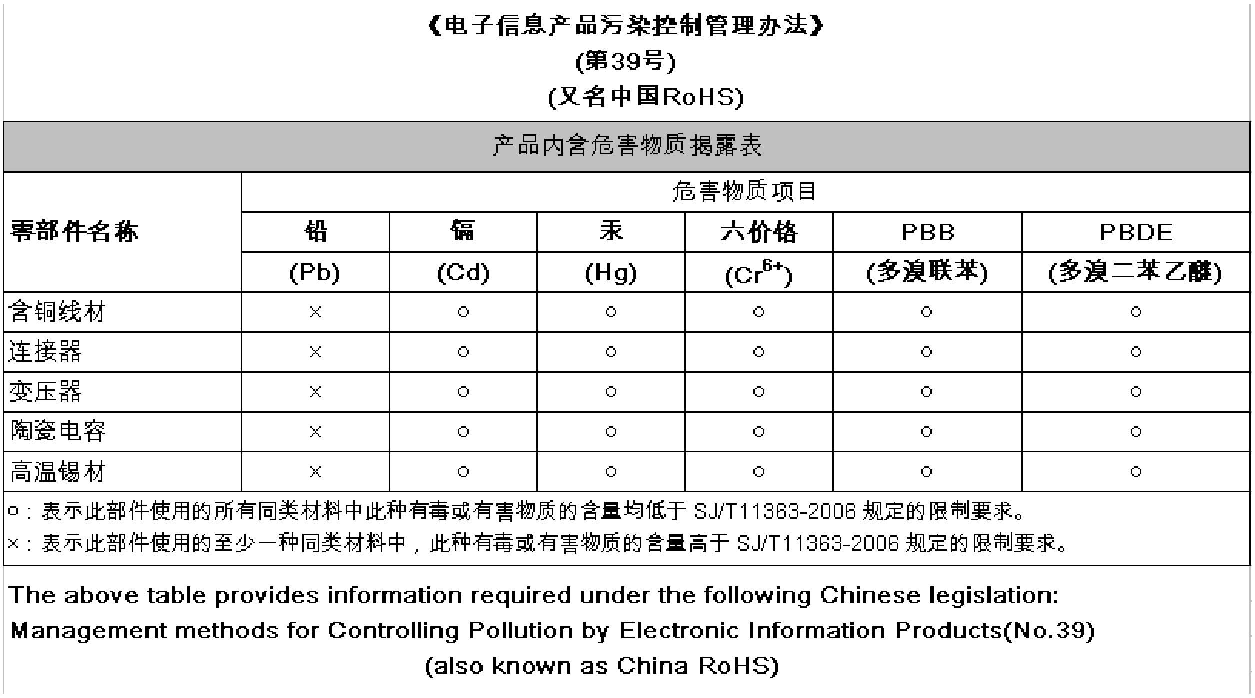
Disposal of Electronic and Electrical Waste

Pursuant to the WEEE EU Directive electronic and electrical waste must not be disposed of with unsorted waste. Please contact your local recycling authority for disposal of this product.



《电子信息产品污染控制管理办法》
(第39号)
(又名中国RoHS)

产品内含危害物质揭露表						
零部件名称	危害物质项目					
	铅	**镉**	**汞**	**六价铬**	PBB	PBDE
	(Pb)	(Cd)	(Hg)	(Cr^{6+})	**(多溴联苯)**	**(多溴二苯乙醚)**
含铜线材	×	○	○	○	○	○
连接器	×	○	○	○	○	○
变压器	×	○	○	○	○	○
陶瓷电容	×	○	○	○	○	○
高温锡材	×	○	○	○	○	○

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About This Manual

This manual describes the SU-A-EZ Subscriber Unit and details how to install, operate and manage it.

This manual is intended for technicians responsible for installing, setting and operating the BreezeACCESS-EZ system, and for system administrators responsible for managing the system.

This manual contains the following chapters and appendices:

- **Chapter 1 - Product Description** - Describes the SU-A-EZ unit and its functionality.

- **Chapter 2 - Installation** - Describes how to install the SU-A-EZ and how to connect to subscriber's equipment.

- **Chapter 3 - Initial Configuration** - Describes how to initially configure the SU-A-EZ in order to test basic link operation.

- **Chapter 4 - Web-managed Configuration**- Describes advanced configuration of the SU-A-EZ using a web browser.

- **Chapter 5 - Command Line Interface** - Describes advanced configuration of the SU-A-EZ using Telnet.

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Chapter 1 - Product Description

In This Chapter:

1.1 Introducing BreezeACCESS-EZ

BreezeACCESS-EZ is a high capacity, IP services oriented Broadband Wireless Access system. The system provides network connections that are always on, supporting immediate access to the Internet and other IP services at high data rates.

Part of an extended and field-proven product portfolio, BreezeACCESS-EZ is an integral part of the BreezeACCESS family, one of the most widely deployed broadband wireless access systems in the world. With capacity of up to 24 Mbps per Access Unit, the EZ solution enables the delivery of powerful broadband services to more subscribers.

With a range of up to 12 Km and lower equipment and deployment costs, BreezeACCESS-EZ enables service providers to wirelessly extend their services to customers who were previously unable to afford them, while securing rapid ROI. Remote residential areas can now benefit from high-speed Internet access, Web browsing and e-mail, and advanced applications such as multi-media services.

An out-of-the-box solution with immediate available local stock, BreezeACCESS-EZ enables virtually instant network expansion and simplified deployment. BreezeACCESS-EZ presents a step forward in overcoming the digital divide by providing an affordable solution that offers vast opportunities for enhanced communication, education, business, social development and improved quality of life.

BreezeACCESS-EZ products operate in unlicensed frequency bands in Time Division Duplex (TDD) mode, using Orthogonal Frequency Division Multiplexing (OFDM) modulation with Forward Error Correction (FEC) coding. Using the enhanced multi-path resistance capabilities of OFDM modem technology, the system enables operation in near-line-of-sight environments. These qualities enable service providers to reach a previously inaccessible and broader segment of the subscriber population.

The Access Units are currently available in several 5 GHz frequency bands. The available frequencies, as well as other parameters, depend on applicable local regulations. The actual operating frequencies used by the system can be configured according to applicable radio regulations and specific deployment considerations.

The SU-EZ CPEs supports all frequencies from 4.900 to 5.875 GHz with automatic band and frequency detection, enabling fast and simple plug-and-play installation.

1.2 The SU-A-EZ

The Outdoor SU-A-EZ is a wireless client CPE that provides a connection to a remote AU-EZ Access Unit. The SU-A-EZ operates as an IEEE 802.11a wireless client, providing a high-speed wireless link between two sites that can be up to 12 Km apart.

The SU-A-EZ Subscriber Unit includes the following components:

- Indoor Unit (IDU)
- Outdoor Unit (ODU)

The IDU connects to the network through a standard IEEE 802.3 Ethernet 10/100BaseT (RJ 45) interfaces and is powered from the 110/220 VAC mains. The IDU is connected to the ODU via a Category 5 Ethernet cable. This cable carries Ethernet traffic between the indoor and the outdoor units, and also transfers power (54 VDC) from the indoor unit to the outdoor unit.

The ODU outdoor unit contains the processing and radio modules and includes an integrated high-gain antenna. The ODU is housed in a weatherproof enclosure for mounting outdoors and includes its own bracket for attaching to a pole, radio mast, or tower structure.

The SU-EZ CPEs supports all frequencies from 4.900 to 5.875 GHz with automatic frequency detection, enabling fast and simple plug-and-play installation.

The SU-A-EZ can be managed through an easy-to-use web interface, CLI, or SNMP.

1.3 Specifications

1.3.1 Radio

Table 1-1: Radio Specifications

Item	Description
Radio Type	IEEE 802.11a
Frequency Band	4900-5865 MHz multi-band with automatic frequency detection
Operating Channels	■ FCC: 5.260, 5.280, 5.300, 5.320, 5.500, 5.520, 5.540, 5.560, 5.580, 5.600, 5.620, 5.640, 5.660, 5.680, 5.700, 5.745, 5.765, 5.785, 5.805, 5.825 GHz ■ UK: 5.740, 5.750, 5.760, 5.770, 5.780, 5.830, 5.840 GHz ■ ETSI: 5.500, 5.520, 5.540, 5.560, 5.580, 5.600, 5.620, 5.640, 5.660, 5.680, 5.700 GHz ■ Japan: 4.920, 4.940, 4.960, 4.980 GHz (not supported currently by AU-EZ) ■ Universal: 4.900 ~ 5.865 GHz in 5 MHz steps
Operation Mode	Time Division Duplex (TDD)
Channel Bandwidth	20 MHz
Data Rates	Normal Mode: 6, 9, 12, 18, 24, 36, 48, 54 Mbps per channel
Maximum Throughput	12 Mbps Upload, 12 Mbps download
Radio Technology	Orthogonal Frequency Divisional Multiplexing (OFDM)
Modulation Technique	Binary Phase Shift Keying (BPSK) @ 6 and 9 Mbps Quadrature Phase Shift Keying (QPSK) @ 12 and 18 Mbps 16-Quadrature Amplitude Modulation (QAM) @ 24 & 36 Mbps 64-QAM @ 48 & 54 Mbps
FEC Coding Rates	1/2 2/3, 3/4
Max Tx Power Levels at Antenna Port	18 dBm*
TPC (Transmit Power Control)	100%, 50%, 25%, 12.5%, Min (0 dBm).
Antenna	Integrated Flat Panel Antenna, 17dBi, 24°AZ x 18°EL.

*The maximum value can be lower depending on the radio band and modulation used. Check Table 1-3 for details

1.3.2 Sensitivity

Table 1-2: Sensitivity

Data Rate	Sensitivity (dBm)			
Modulation/Rate	**5.150-5.250 GHz**	**5.250-5.350 GHz**	**5.500-5.700 GHz**	**5.725-5.825 GHz**
BPSK (6 Mbps)	-89	-89	-89	-89
BPSK (9 Mbps)	-88	-88	-88	-88
QPSK (12 Mbps)	-86	-86	-86	-87
QPSK (18 Mbps)	-84	-84	-84	-84
16 QAM (24 Mbps)	-81	-81	-81	-80
16 QAM (36 Mbps)	-77	-77	-77	-77
64 QAM (48 Mbps)	-73	-73	-73	-71
64QAM (54 Mbps)	-71	-71	-70	-67

1.3.3 Transmit Power

Table 1-3: Transmit Power

	Maximum Output Power (dBm)			
Data Rate	**5.150-5.250 GHz**	**5.250-5.350 GHz**	**5.500-5.700 GHz**	**5.725-5.825 GHz**
6 Mbps	18	18	18	18
9 Mbps	18	18	18	17
12 Mbps	18	18	18	17
8 Mbps	18	18	18	17
24 Mbps	18	18	18	17
36 Mbps	18	18	18	17
48 Mbps	17.5	17	17	16.5
54 Mbps	17.5	17	16.5	15

1.3.4 Configuration and Management

Table 1-4: Configuration and Management

Item	Description
Management options	■ Web-based (HTTP/HTTPS) ■ Telnet, SSH (CLI) ■ SNMP
SNMP agent	V1 / V2c, supports 802.11 MIB, RFC-1213 MIB II and private MIB.
Management access	From Wired LAN, Wireless Link
Management access protection	Access Password
Encryption	WEP 152-bits
Allocation of IP parameters	Configurable or automatic (DHCP client)
Software upgrade	HTTP/FTP/TFTP
Configuration Upload/Download	HTTP

1.3.5 Mechanical

Table 1-5: Mechanical Specifications

Item	Description
Dimensions	195mm (W) X 190mm (H) X 74mm (D)
Weight	1.47Kg
Mounting Bracket Rotation	+/- 360º

1.3.6 Electrical

Table 1-6: Electrical Specifications

Type	Details
AC Power Supply	100-240VAC, 50-60Hz, maximum power consumption 1.5A, meet LPS request
ODU Power supply	55 VDC from the IDU over the indoor-outdoor Ethernet cable

1.3.7 Environmental

Table 1-7: Environmental Specifications

Item	**Details**
Operating Temperature	Outdoor Unit: -40ºC to 60ºC Indoor Unit: 5ºC to 50ºC
Humidity	Maximum 95%, non-condensing.
Water Proof (ODU)	IP-67

1.3.8 Standards Compliance

Table 1-8: Standards Compliance

Type	**Standard**
EMC	■ EN55022 CE Class B ■ FCC Class B Part 15 ■ VCCI Class B
Safety	■ UL / CUL (CSA60950-1, UL60950-1) ■ CE / CB (EN60950-1/IEC 60950-1)
Lightning	The unit withstand at +4KV of Input surge, 1.2usec rise/fall time, 50µsec duration, every 10 seconds, for all interfaces.
Radio	■ ETSI 301 893 (11a) ■ ETSI 301 489 (DC power) ■ FCC Part 15 (11a) ■ RSS210 (Canada) ■ TELEC

2

Chapter 2 - Hardware Installation

In This Chapter:

2.1 Installation Requirements

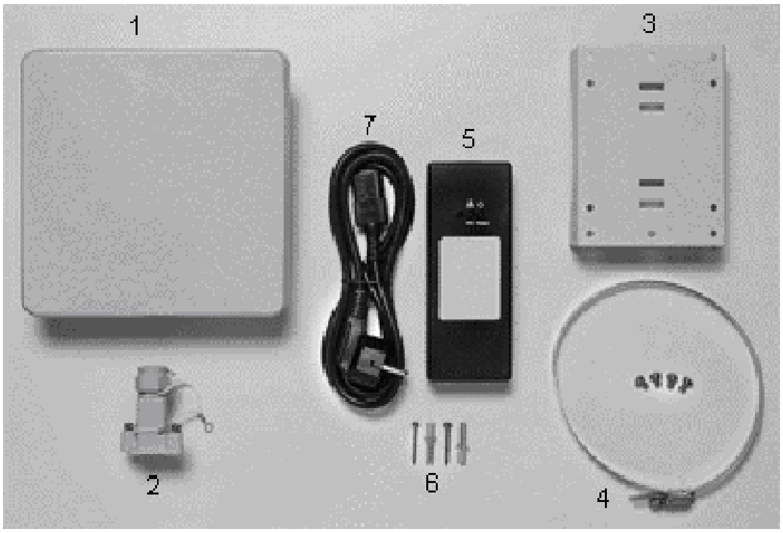
2.1.1 Packing List

The SU-A-EZ package includes the following components:

- SU-A-EZ CPE Outdoor Unit with integrated antenna (1)
- A Service Box (Sealing Assembly for the ODU's Ethernet connector) (2)
- A pole mounting kit for the SU-A-EZ, including a mounting plate (3) and a metal band and four screws (4)
- IDU Indoor Unit (5) with two screws and two anchors (6) for wall-mounting the IDU
- Mains power cord (7)

In addition:

- Two sets of stickers (with the ODU). Each set includes two stickers, one with the ODU's MAC address and one with the S/N details.
- This Quick Installation Guide.



2.1.2 Additional Equipment and Tools Required for Installation

- Ethernet cable for connecting to the user’s data equipment (straight-through for connecting to a switch/hub/router, or cross-over for connecting to a PC).
- Indoor-to-outdoor Category 5E Ethernet cable. Use only Category 5E cables approved by the supplier. The length of the Indoor-to-Outdoor cable should not exceed 90 meters. The length of the Indoor-to-Outdoor cable, together with the length of the Ethernet cable connecting the IDU to the data equipment, should not exceed 100 meters.
- Two shielded RJ-45 connectors, and a suitable crimping tool.
- Grounding cable with appropriate terminations.
- Mains plug adapter or termination plug (if the power plug on the supplied AC power cord does not fit local power outlets).
- Portable PC/Notebook for configuring parameters using either Telnet (CLI) or a web browser.
- Installation tools and materials, including appropriate means (e.g. a pole) for installing the outdoor unit.

2.2 Installation Steps

CAUTION

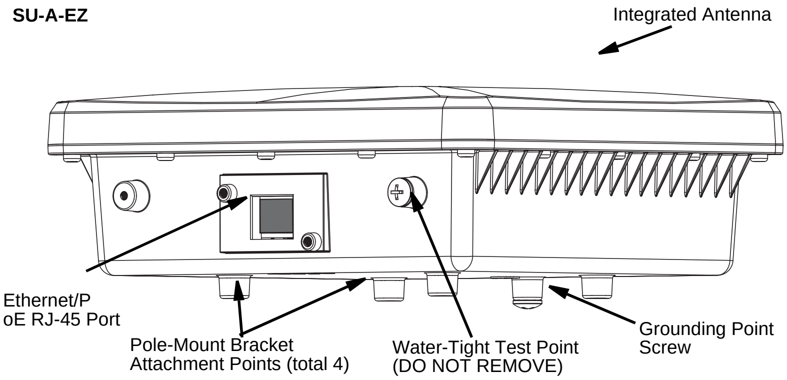
ONLY experienced installation professionals who are familiar with local building and safety codes and, wherever applicable, are licensed by the appropriate government regulatory authorities should install outdoor units and antennas.

Failure to do so may void the BreezeMAX product warranty and may expose the end user or Service Provider to legal and financial liabilities. Alvarion and its resellers or distributors are not liable for injury, damage or regulation violations associated with the installation of Outdoor Units or antennas.

Hardware installation of the SU-A-EZ involves these steps:

1. Mount the outdoor unit on a pole, mast, or tower using the mounting bracket.
2. Connect the Ethernet cable and a grounding wire to the unit.
3. Connect the power injector IDU to the Ethernet cable, user’s data equipment, and an AC power source.
4. Align the antenna for optimal performance.

2.3 ODU Hardware Description



2.3.1 Integrated High-Gain Antenna

The SU-A-EZ ODU includes an integrated high-gain (17 dBi) flat-panel antenna for 5 GHz operation.

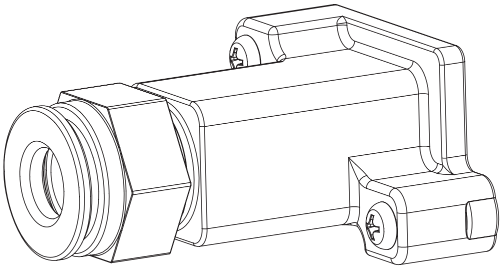
2.3.2 Ethernet Port

The SU-A-EZ ODU has one 10BASE-T/100BASE-TX RJ-45 port that connects to the power injector IDU using an Ethernet cable. The Ethernet port connection provides power to the SU-A-EZ as well as a data link to the local network via the IDU.

The unit appears as an Ethernet node and performs a bridging function by moving packets from the wired LAN to the remote Access Unit (from here on in referred to as AU.)

2.3.3 Ethernet Port Cover (Service Box)

The SU-A-EZ's RJ-45 Ethernet port requires the use of a weatherproof cover to seal the unit.



2.3.4 Grounding Point

Even though the SU-A-EZ includes its own built-in lightning protection, it is important that the unit is properly connected to ground. A grounding screw is provided for attaching a ground wire to the unit.

2.3.5 Water Tight Test Point

CAUTION

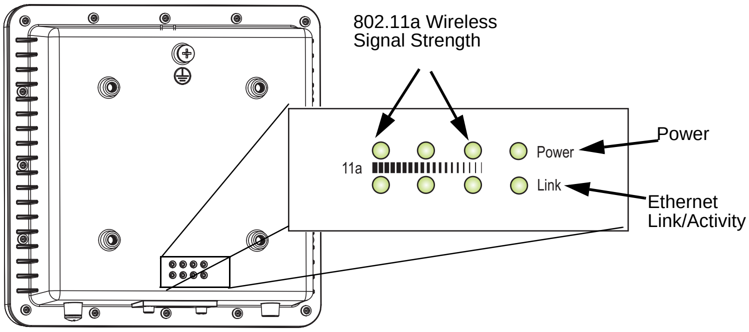
Do no remove or loosen this screw. Doing so could lead to damage of the unit.

2.3.6 Pole-Mounting Bracket Attachment Points

The SU-A-EZ includes a bracket kit that can be used to mount the unit to a pole, radio mast, or part of a tower structure.

2.3.7 LED Indicators

The SU-A-EZ includes status LED indicators located on the base of the unit, as indicated in the following figure.



The following table describes the system status LEDs:.

LED	Status	Description
Power	On Green	Indicates that the system is working normally.
	On Amber	Indicates a system reset.
Link	On Green	Indicates a valid 10/100 Mbps Ethernet cable link.
	Flashing Green	Indicates that the SU-A-EZ is transmitting or receiving data on a 10/100 Mbps Ethernet LAN. Flashing rate is proportional to network activity.

The three pairs of the 11a LEDs display the received signal strength and can be used for aligning antennas in the wireless link.

The following table describes the wireless status LEDs:

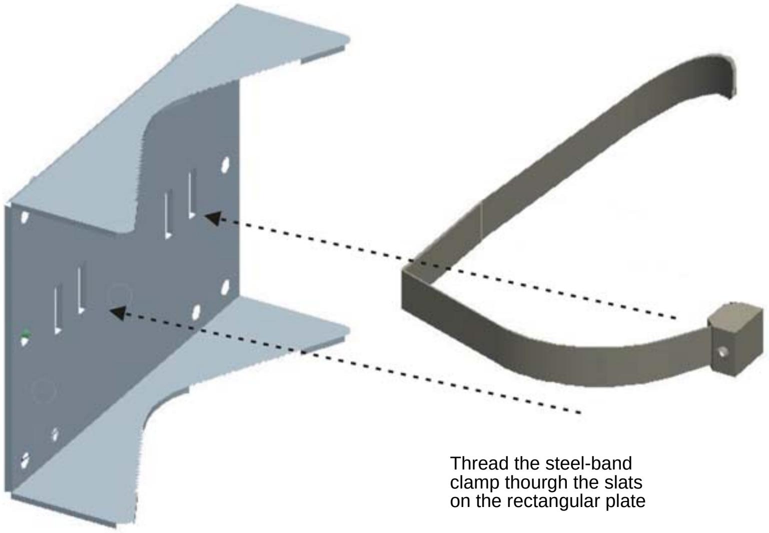
11a LEDs Status			Description
Right Pair	**Center Pair**	**Left Pair**	
Off	Off	Off	The radio is disabled or unit is still booting up
Blinking-slowly	Off	Off	No signal detected or RSSI is below -88 dBm
Blinking-fast	Off	Off	RSSI is between -88 dBm and -87 dBm
Blinking-very fast	Off	Off	RSSI is between -86 dBm and -85 dBm
On	Off	Off	RSSI is between -84 dBm and -82 dBm
On	Blinking-slowly	Off	RSSI is between -81 dBm and -80 dBm
On	Blinking-fast	Off	RSSI is between -79 dBm and -78 dBm
On	Blinking-very fast	Off	RSSI is between -77 dBm and -76dBm
On	On	Off	RSSI is between -75 dBm and -74 dBm
On	On	Blinking-slowly	RSSI is between -73 dBm and -72 dBm
On	On	Blinking-fast	RSSI is between -71 dBm and -70 dBm
On	On	Blinking-very fast	RSSI is between -69 dBm and -68 dBm
On	On	On	RSSI is over -67dBm

2.4 Mounting the SU-A-EZ ODU

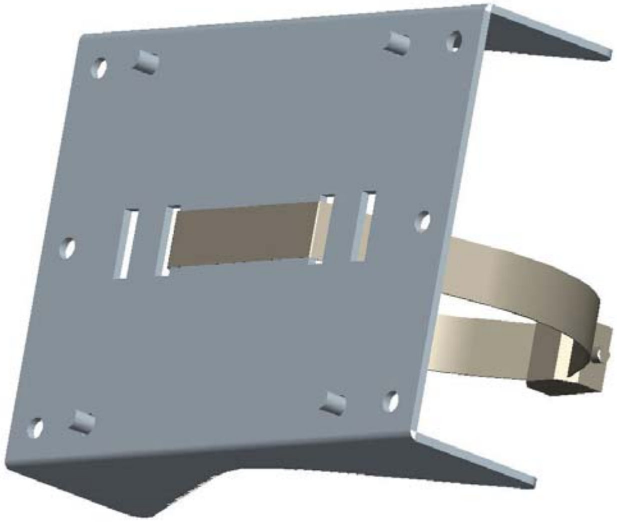
The SU-A-EZ’s pole-mounting bracket has two parts: One rectangular plate with V-shaped edges that attaches directly to the SU-A-EZ ODU, and one steel-band clamp that secures the unit to a pole. The rectangular plate connects to the unit using four screws. The steel-band clamp threads through the rectangular plate and around the pole to which it fastens.

Perform the following steps to mount the unit to a 1.5 to 2 inch diameter steel pole or tube using the mounting bracket:

1 Thread the provided steel-band through the rectangular plate.



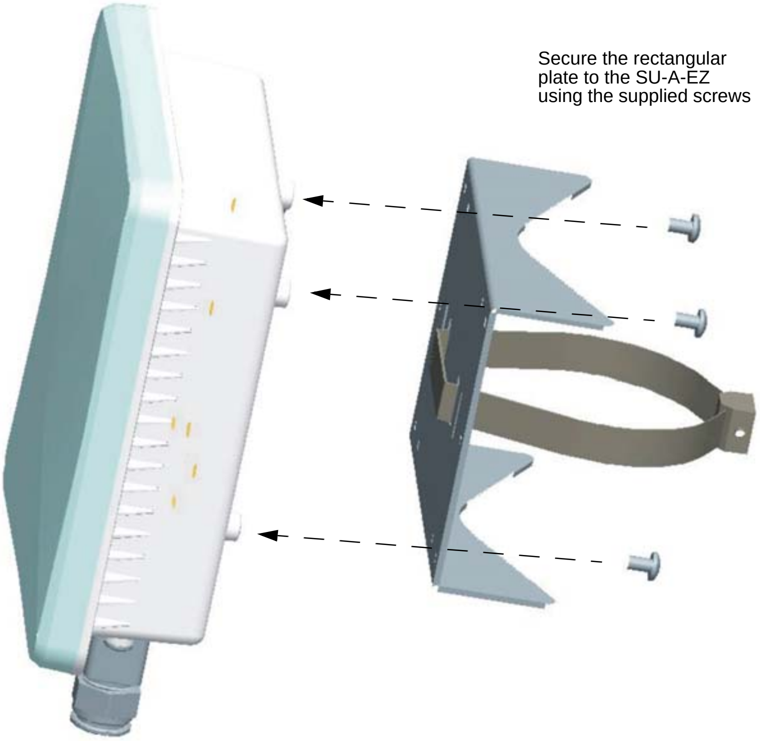
Thread the steel-band clamp thourgh the slats on the rectangular plate



2 Attach the rectangular mounting plate to the SU-A-EZ using the supplied four screws.

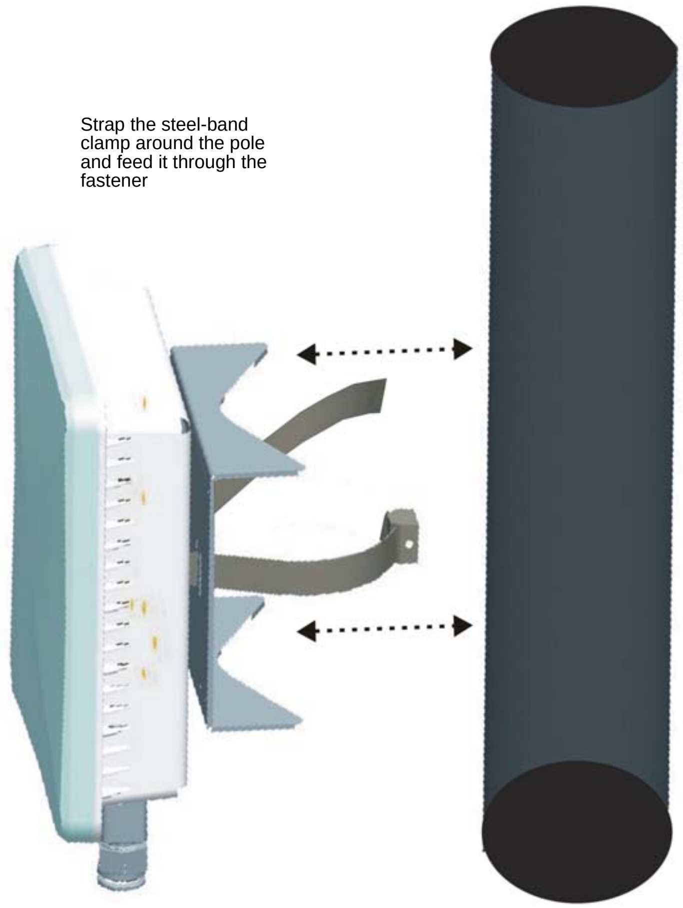
NOTE

The mounting plate can be attached to the unit in a way that allows it to be mounted vertically or at a 45 degree angle.



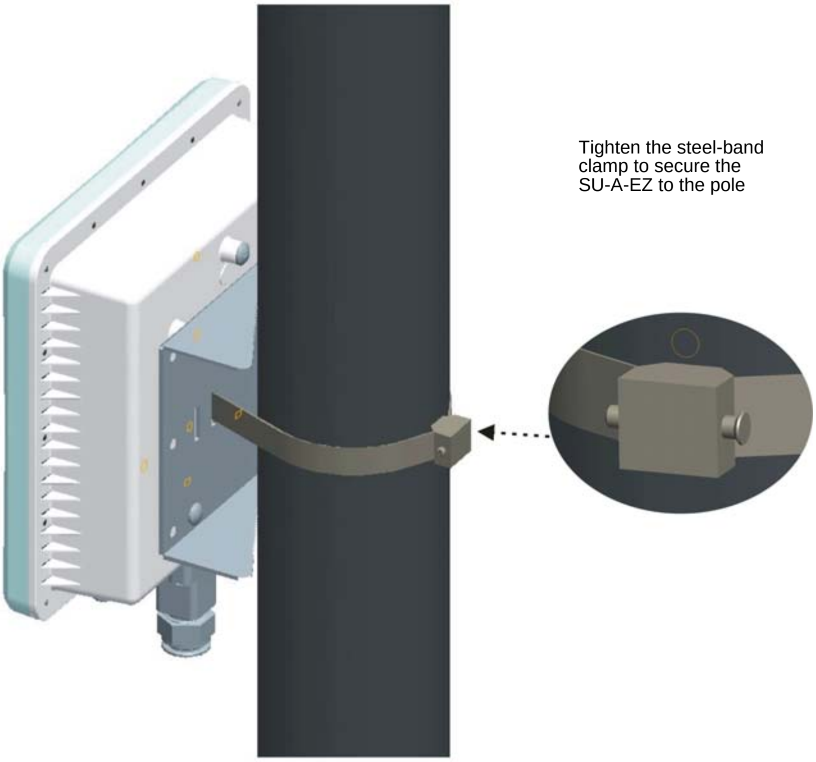
Secure the rectangular
plate to the SU-A-EZ
using the supplied screws

3 Place the SU-A-EZ with its attached rectangular plate on one side of the pole and strap the steel-band clamp around the pole. Feed the steel band through its fastener and secure it tightly.


Strap the steel-band clamp around the pole and feed it through the fastener

NOTE

Be sure to take account of the antenna polarization direction; antennas in a link must be mounted with the same polarization.



Tighten the steel-band clamp to secure the SU-A-EZ to the pole

2.5 Connecting Cables to the Outdoor Unit

WARNING

Do not connect or disconnect cables or otherwise work with the SU-A-EZ during periods of lightning activity.

2.5.1 IDU-ODU Cables

NOTE

The length of the Indoor-to-Outdoor cable should not exceed 90 meters. The length of the Indoor-to-Outdoor cable, together with the length of the Ethernet cable connecting the IDU to the data equipment, should not exceed 100 meters.

Use only Category 5E Ethernet cables from either Alvarion or any of the approved manufacturers, listed in Table 2-9. Consult with Alvarion's specialists on the suitability of other cables.

Table 2-9: Approved Category 5E Ethernet Cables

Manufacturer	Part Number
Superior Cables Ltd. www.superior-cables.com	612098
HES Cabling Systems www.hescs.com	H5E-00481
Teldor www.teldor.com	8393204101
Southbay Holdings Limited 11th Fl., 15, Lane 347, Jong Jeng Rd. Shin Juang City, Taipei County Taiwan, R.O.C. Attn: Eva Lin Tel. 886-2-2832 3339 Fax. 886-2-2206 0081 E-mail: eva@south-bay.com.tw	TSM2404A0D
GU-Tech., LLC . - A Member of OVIS GroupTel/Fax : 732 918 8221 Mobile: 718 909 4093 www.OVIS.COM.TW www.GU-TECH.COM	

In case of missing information in the manufacturer's WEB site (product specifications, ordering issues, etc.), it is highly recommended to contact the manufacturer's sales representative directly.

2.5.2 Preparing and Connecting the IDU-ODU Cable

1. Unscrew the top nut from the Service Box.
2. Route a straight-through Cat. 5 Ethernet cable (8-wire, 24 AWG) through both the top nut and the body of the Service Box.
3. Insert and crimp the RJ-45 connector. Refer to the cable preparations instructions described below.
4. Connect the Ethernet cable to the ODU RJ-45 connector.
5. Attach the Service Box to the ODU and tighten the top nut. Make sure that the external jack of the cable is well inside the Service Box to guarantee good sealing.
6. Route the cable to the location selected for the indoor equipment. It is recommended to attach a lightning arrestor to the cable immediately before it enters the building.
7. Assemble an RJ-45 connector on the indoor end of the ODU cable. Refer to the pin assignment and color codes in standard cables described below.

IDU-ODU Cable Preparation:

Use a crimp tool for RJ-45 connectors to prepare the wires. Insert them into the appropriate pins and use the tool to crimp the connector. Make sure to do the following:

- Remove as small a length as possible of the external jacket. Verify that the external jacket is well inside the sealing cover when connected to the unit, to ensure good sealing.

- Pull back the shield drain wire before inserting the cable into the RJ-45 connector, to ensure a good connection with the connector's shield after crimping.

The IDU-ODU cable provides pin-to-pin connection on both ends.

The following figure shows the required wire pair connections.

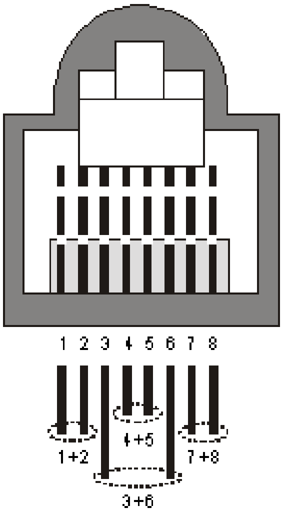


Figure 2-1: Ethernet Connector Pin Assignments

The color codes used in standard cables supplied by Alvarion are as listed in the following table:

Table 2-10: Cable Color Codes

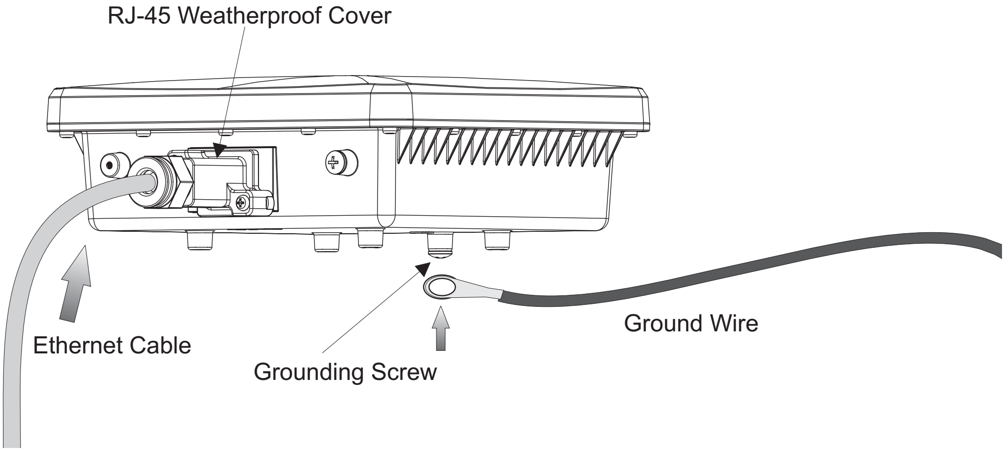
Wire color	Pin
Blue	1
Blue/white	2
Orange	3
Orange/white	6
Brown	4
Brown/white	5
Green	7
Green/white	8

2.5.3 Grounding Wire

Be sure to ground the Outdoor Unit with an appropriate grounding wire (not included) by connecting the grounding point on the base of the unit to a good ground (earth) connection.

CAUTION

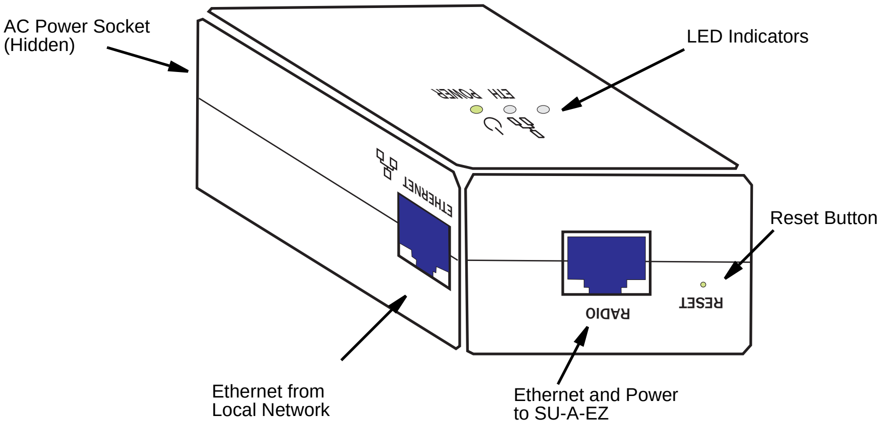
Be sure that grounding is available and that it meets local and national electrical codes. For additional lightning protection, use lightning rods, lightning arrestors, or surge suppressors.



2.6 The Power Injector IDU

The SU-A-EZ receives power through its network cable connection using power-over-Ethernet technology. A power injector IDU is included in the SU-A-EZ package and provides two RJ-45 Ethernet ports, one for connecting to the SU-A-EZ (Radio), and the other for connecting to a local LAN switch (Ethernet).

The Ethernet port uses an MDI (i.e., internal straight-through) pin configuration. You can therefore use straight-through twisted-pair cable to connect this port to most network interconnection devices such as a switch or router that provide MDI-X ports. However, when connecting the SU-A-EZ to a workstation or other device that does not have MDI-X ports, you must use a crossover twisted-pair cable.



The SU-A-EZ does not have a power switch. It is powered on when its Ethernet port is connected to the power injector module, and the power injector module is connected to an AC power source.

The Power LED indicates whether AC power is applied. The Link LED does not function in current release of SU-A-EZ.

In the current release, the Reset button does not function.

The power injector module automatically adjusts to any AC voltage between 100-240 volts at 50 or 60 Hz. No voltage range settings are required.

WARNING

The power injector module is designed for indoor use only. Never mount the power injector outside with the SU-A-EZ unit.

2.7 Connecting the Power Injector IDU Cables

The unit can be placed on a desktop or a shelf. Alternatively, it may be wall-mounted using the kit supplied with the unit.

CAUTION

Do not install the power injector outdoors. The unit is for indoor installation only.

CAUTION

Install lightning protection at the power injector end of the Ethernet cable, use a lightning arrestor immediately before the cable enters the building.

NOTE

The SU-A-EZ's Ethernet port does not support Power over Ethernet (PoE) based on the IEEE 802.3af standard. Do not try to power the unit by connecting it directly to a network switch that provides IEEE 802.3af PoE. Always connect the unit to the included power injector module.

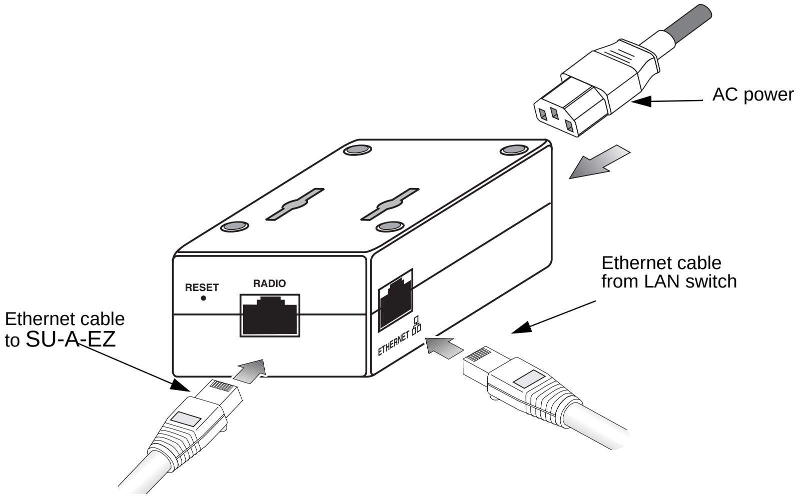
To connect the IDU cables:

1 Connect the Ethernet cable from the SU-A-EZ ODU to the RJ-45 port labeled “Radio” on the power injector IDU.

2 Connect a straight-through unshielded twisted-pair (UTP) cable from a local LAN switch/router to the RJ-45 port labeled “Ethernet” on the power injector. If you connect to a workstation, use a crossover cable. Use Category 5E or better UTP cable for 10/100BASE-TX connections.

NOTE

The RJ-45 port on the power injector is an MDI port. If connecting directly to a computer, use a crossover cable



3 Insert the power cable plug directly into the standard AC receptacle on the power injector.

4 Plug the other end of the power cable into a grounded, 3-pin socket, AC power source.

NOTE

For International use, you may need to change the AC line cord. You must use a line cord set that has been approved for the receptacle type in your country.

5 Check the Power LED on top of the power injector IDU to be sure that power is being supplied to it.

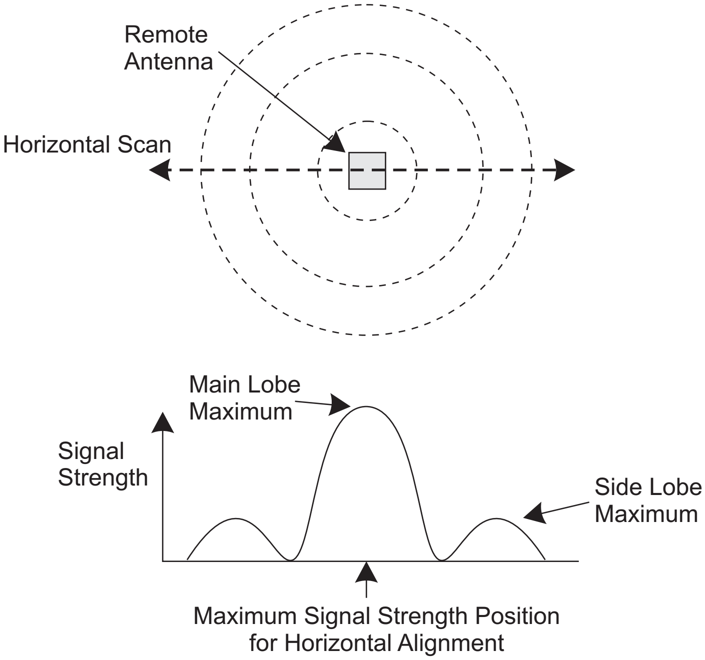
2.8 Align the Antenna

After the SU-A-EZ unit has been mounted, connected, and its radio is operating, the antenna must be accurately aligned to ensure optimum performance on the wireless link. This alignment process is particularly important for long-range links.

To start the alignment process, you can just point the antenna in the general direction of the Access Unit's antenna using binoculars or a compass. For accurate alignment, you must monitor the signal strength LEDs as the antenna moves horizontally.

The signal strength LEDs indicate the received radio signal strength for the link. The more LEDs that turn on, the stronger the signal.

When you move the antenna during alignment, the radio signal from the remote antenna can be seen to have a strong central main lobe and smaller side lobes. The object of the alignment process is to set the antenna so that it is receiving the strongest signal from the central main lobe.



To align the antennas in the link, monitor the signal strength LEDs. For details see "LED Indicators" on page 14. Perform the following procedure:

1. Pan the SU-A-EZ antenna horizontally back and forth while checking the LEDs. Using the pole-mounting bracket with the unit, you must rotate the mounting bracket around the pole.
2. Find the point where the signal is strongest (refer to “LED Indicators” on page 14) and secure the bracket in that position.

NOTE

Sometimes there may not be a central lobe peak because vertical alignment is too far off; only two similar peaks for the side lobes are detected.

3

Chapter 3 - Initial Configuration

In This Chapter:

3.1 Introduction

The SU-A-EZ offers a user-friendly web-based management interface for the configuration of all the unit's features. Any PC directly attached to the unit can access the management interface using a web browser, such as Internet Explorer (version 6.0 or above).

The initial configuration steps can be made through the web-browser interface using the default IP address. You can make the initial changes by connecting a PC directly to the Ethernet port of SU-A-EZ's power injector IDU before mounting the unit outdoors in its operating location.

3.2 Setting the Regulatory Domain

Before operating the SU-A-EZ it is important to set the regulatory domain in which the unit is to operate. Not doing so can result in breaching local laws. The unit must be installed by a qualified professional.

The SU-A-EZ has a default IP address of 10.0.0.1 and a subnet mask of 255.0.0.0. If your PC has an IP address (static or assigned by a DHCP server) on the same subnet then you can connect immediately to the command line interface using Telnet. Otherwise, you must first change your PC's IP address to be on the same subnet as the SU-A-EZ.

To set the regulatory domain you must log into Installer mode from the command prompt. Specify "installer" as the operating mode and the default password is also "installer". For more information on using Telnet and the command prompt see Chapter 5 - "Command Line Interface."

Example.

```
ClientSta login: installer
Password:*********
Installer#
```

Then type "regdomain" followed by the RETURN key. The unit then displays all possible domain settings. The options are:

- **FCC -** Federal Communications Commission.
- **ETSI -** European Telecommunications Standards Institute.
- **UK -** United Kingdom.
- **JAPAN -** Japan. Not applicable for current release.
- **Universal -** This selects all frequencies in the 802.11a radio bands.
- **WLG -** Not applicable for current release.Access restricted.

WARNING

You must select the regulatory domain that is legally permissable for the country in which you intend to operate the SU-A-EZ.

This example shows how to display all possible regulatory domains by entering the syntax "regdomain" followed by the Enter (Return) key. The FCC domain is then selected by entering the syntax "regdomain FCC".

Example

```
Installer# regdomain
Usage :
        regdomain [FCC | ETSI | UK | JAPAN | Universal | WLG]
Installer# regdomain FCC
Installer#
```

In order to apply the new selected regulatory domain you need to use the command "set ClientSta status-update yes" to apply them and "save-running" command to save all changes. The unit must be reset to fully apply the changes.

3.3 Configuring Basic Parameters

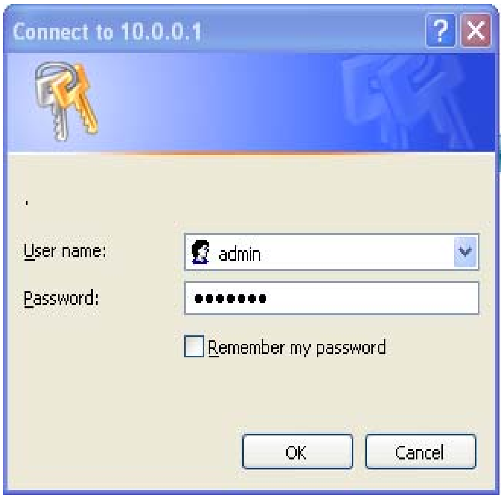
Several parameters must be configured to ensure that the unit can function properly and connect to the Access Unit. Additional parameters may be configured later, either locally or remotely over the wireless link.

3.3.1 Accessing the Web Management Interface

The SU-A-EZ has a default IP address of 10.0.0.1 and a subnet mask of 255.0.0.0. If your PC has an IP address (static or assigned by a DHCP server) on the same subnet then you can connect immediately to the web interface. Otherwise, you must first change your PC's IP address to be on the same subnet as the SU-A-EZ.

In the web browser's address bar, type the default IP address:
http://10.0.0.1.

The web browser displays the SU-A-EZ's login window.



Connect to 10.0.0.1

User name: admin

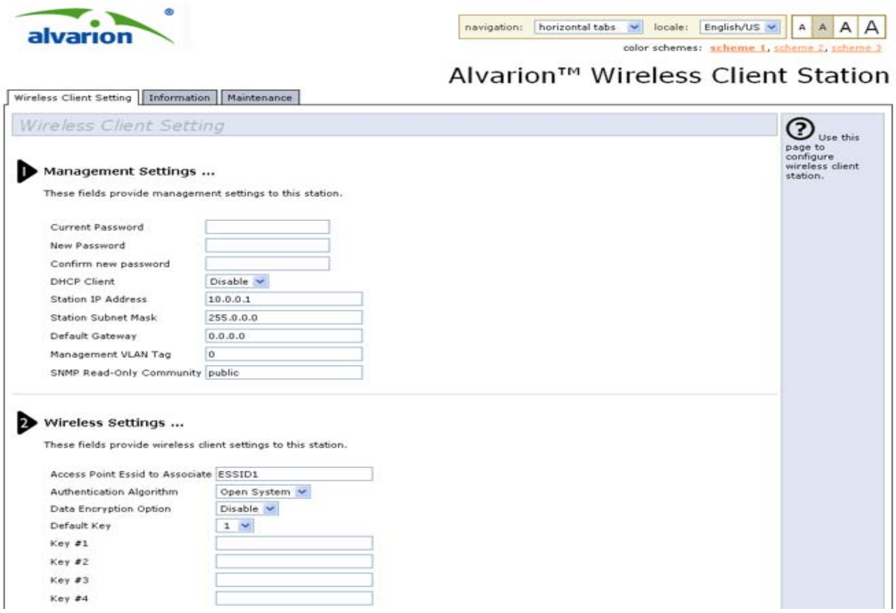
Password: •••••••

□ Remember my password

Figure 3-2: Login Window

Logging In – Type the default user name "admin" and password "private", then click OK.

The management interface displays.



Alvarion™ Wireless Client Station

Wireless Client Setting

1 Management Settings ...

These fields provide management settings to this station.

Current Password	
New Password	
Confirm new password	
DHCP Client	Disable
Station IP Address	10.0.0.1
Station Subnet Mask	255.0.0.0
Default Gateway	0.0.0.0
Management VLAN Tag	0
SNMP Read-Only Community	public

2 Wireless Settings ...

These fields provide wireless client settings to this station.

Access Point Essid to Associate	ESSID1
Authentication Algorithm	Open System
Data Encryption Option	Disable
Default Key	1
Key #1	
Key #2	
Key #3	
Key #4	

Use this page to configure wireless client station.

Figure 3-3: The SU-A-EZ Management Interface

3.3.2 Basic Parameters

There are only a few basic steps you need to set up the SU-A-EZ and provide a connection to your service provider’s Access Unit.

Follow these steps:

1 **Set a New Password** – On the Wireless Client Setting page, enter a new password to replace the default “private”.

NOTE

It is strongly recommended that you configure your own password. If a password is not configured, the management interface is not protected and anyone that can connect to the SU-A-EZ may be able to compromise your network security.

2 **Set the ESSID** (Extended Service Set Identifier) – Enter the SSID, or wireless network name, of the network you want to connect to. All SU-A-EZs in the same network must use the same SSID as the remote access point to associate. The SSID is case sensitive and can consist of up to 31 alphanumeric characters.

3 **Enter WEP Keys** – If the wireless network you are connecting to uses WEP security, you need to enter the WEP key provided to you by the network operator. Enter “0x” followed by 32 hexadecimal digits (0 to 9 and A to F) for 152 bit keys. Note that Authentication Algorithm, Data encryption, Default key and all 4 keys (or at least the one selected as the default) must be configured

with the same values as those configured in the AP in order to ensure proper operation.

4 **Change the SU-A-EZ IP Address** – If the SU-A-EZ's default IP address is not compatible with the network you want to connect to, enter an appropriate IP address and subnet mask as provided by the network operator.

5 **Save Your Settings** – Click the "Update" button to save all your changes.

4

Chapter 4 - Web-managed Configuration

In This Chapter:

4.1 Introduction

The SU-A-EZ's basic wireless client settings can be configured as described in the previous chapter, "Initial Configuration." This chapter describes all the unit's settings and features in more detail.

4.1.1 Main Menu

The System Configuration pages include the following options.

Table 4-1: Menu

Menu	Description	Page
Wireless Client Setting		
Management Settings	Configures the access password, IP address, subnet mask, VLAN tag, and SNMP Read-Only Community setting	43
Password	Configures a new password	43
DHCP Client	Enables / disables the DHCP client	43
Station IP Address	Configures an IP address for the SU-A-EZ	43
Station Subnet Mask	Configures a subnet mask for the SU-A-EZ	44
Default Gateway	Configures a gateway for routing traffic to the SU-A-EZ	44
Management VLAN Tag	Sets the tag for identifying the management VLAN	44
SNMP Read-Only Community	Sets the SNMP Read-only password	44
Wireless Settings	Configures the SSID, WEP keys, and antenna transmit settings	45
Access Point ESSID	Configures the Service Set Identifier of the network you want to connect to	45
Authentication Algorithm	Specifies the authentication method	45
Data Encryption Option	Enables / disables data encryption	45
Default Key	Configures the key number used for encryption	46
WEP Keys	Configures the WEP key provided by the network you wish to associate with	46
RTS Threshold	Configures the packet size threshold for using RTS/CTS mechanism	46
Transmit Power Level	Configures the strength of the radio signal from the SU-A-EZ	46
Modulation Type	Specifies the modulation type	46

Table 4-1: Menu

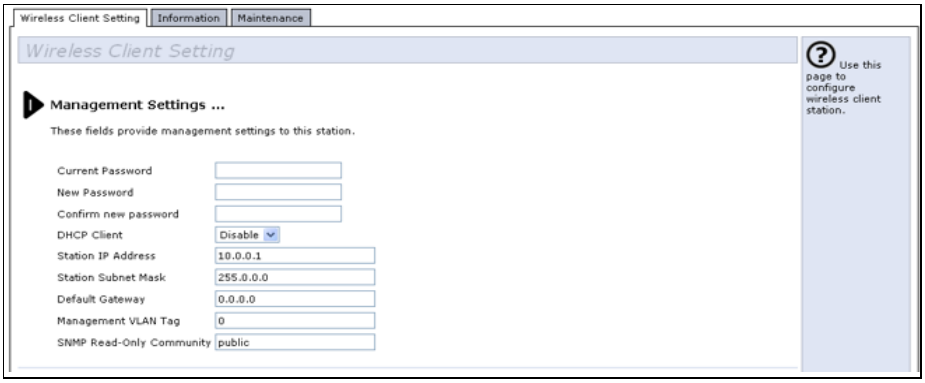
Menu	Description	Page
Link Rate	Configures the maximum rate for sending data	46
RF Distance	Configures the maximum distance of the cell	47
Regulatory Domain	Displays the regulatory domain	47
Information		
Status Information	Displays wireless client configuration settings for the system	48
Access Point ESSID	Displays the Service Set Identifier of the network to which you are connected	48
Access Point MAC Address	Displays the MAC address of the AP to which the SU-A-EZ is connected	48
Channel	Displays the radio channel the SU-A-EZ is transmitting through	48
Frequency	Displays the frequency at which the SU-A-EZ is transmitting	48
Link Quality	Displays the quality of the link between the SU-A-EZ and the AP	48
RSSI	Displays the Receive Signal Strength Indicator	48
Noise Floor	Displays the ambient noise floor	48
Transmit Power Level	Displays the overall power level of the SU-A-EZ in a range of minimum to maximum	48
Rx/Tx Packets/Bytes	Displays the number of packets/bytes that were sent/received over the wireless and Ethernet ports	48
Site survey	Displays wireless site survey information	49
Maintenance		
Configuration	Saves the unit's configuration to a file; restores the configuration from a previously saved file; resets configuration settings to factory defaults; and resets the unit	49
Restore Factory Default	Restores factory default and reboots the SU-A-EZ	49
Save Current Configuration	Saves the current configuration to a backup file; you have the option to save the file in either encrypted or non-encrypted format through the check box	49
Restore Configuration	Restores a previously saved configuration (in either encrypted or non-encrypted format) to the SU-A-EZ	50
Reboot Client Station	Reboots the SU-A-EZ	50
Upgrade	Upgrades software from a local file	50
Model	Displays the SU-A-EZ's model name	50
Platform	Displays the hardware/software platform number	50
MAC Address	Displays the MAC address of the SU-A-EZ	50
Boot Code Version	Displays the current version of the boot code	50

Table 4-1: Menu

Menu	Description	Page
Firmware Version	Displays the current version of the firmware	50
Upgrade via HTTP	Allows the user to upgrade firmware by HTTP	50
Upgrade via TFTP/FTP	Allows the user to upgrade firmware by TFTP/FTP	51

4.2 Management Settings

The SU-A-EZ's basic client settings are described in this section.



Wireless Client Setting

Management Settings ...

These fields provide management settings to this station.

Current Password	
New Password	
Confirm new password	
DHCP Client	Disable
Station IP Address	10.0.0.1
Station Subnet Mask	255.0.0.0
Default Gateway	0.0.0.0
Management VLAN Tag	0
SNMP Read-Only Community	public

Use this page to configure wireless client station.

Current Password – The password used to access the web interface. The default name is "private" (Length: 1-32 characters, case sensitive).

Management access to the web interface on the SU-A-EZ is controlled through a single user name and password. To protect access to the management interface, you need to configure an Administrator password as soon as possible. If the password is not configured, then anyone having access to the SU-A-EZ may be able to compromise the SU-A-EZ and network security.

New Password – The new password for management access. (Length: 1-32 characters, case sensitive)

Confirm New Password – Enter the password again for verification.

DHCP Client – With DHCP Client enabled, the IP address, subnet mask and default gateway can be dynamically assigned to the SU-A-EZ by the network DHCP server. (Default: Disabled). If no DHCP server is found when the unit boots up or the lease of DHCP assignation expires, then the unit will use the configured IP address, subnet mask and default gateway until it can find a proper DHCP server and obtain a valid IP; DHCP server search operation will not stop until the feature is disabled.

Station IP Address – The IP address of the SU-A-EZ. Valid IP addresses consist of four decimal numbers, 0 to 255, separated by periods. If the SU-A-EZ's default IP address is not compatible with the network you want to connect to, enter an appropriate IP address and subnet mask as provided by the network operator.

Configuring the SU-A-EZ with an IP address expands your ability to manage the SU-A-EZ. A number of SU-A-EZ features depend on IP addressing to operate.

Station Subnet Mask – The mask that identifies the host IP address bits used for routing to specific subnets.

NOTE

You can use the web browser interface to access IP addressing only if the SU-A-EZ already has an IP address that is reachable through your network.

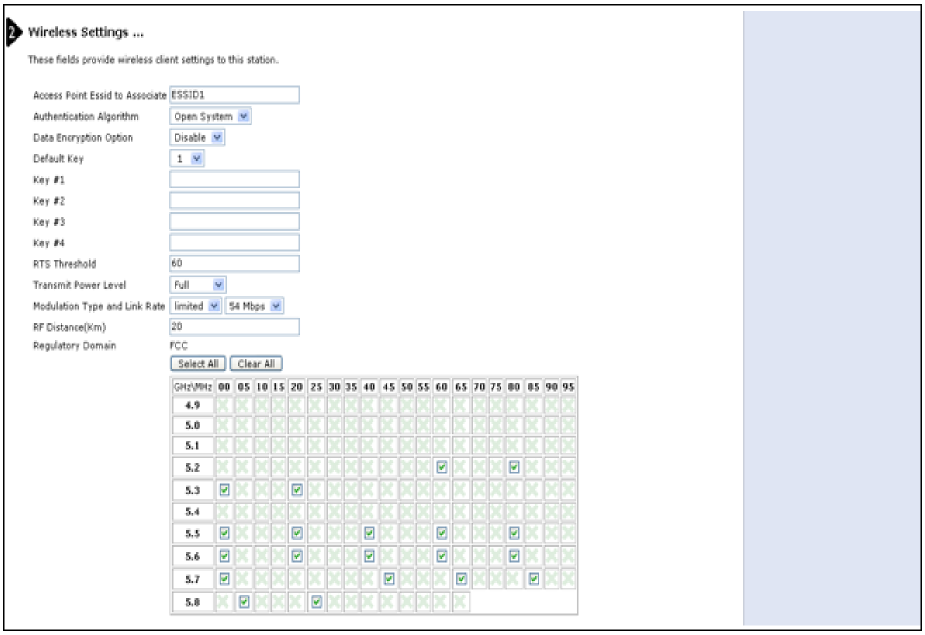
Default Gateway – If a management station exists on another network segment, then you must enter the IP address for a gateway that can route traffic between these segments.

Management VLAN Tag – Sets the tag of the management VLAN. (Default: 0, meaning no VLAN tag)

SNMP Read-Only Community – Sets SNMP Read-only password for SNMP. The default password is “public” (Length: 1~32 characters, case sensitive).

4.3 Wireless Settings

The SU-A-EZ's wireless settings, ESSID, security, regulatory domain, frequencies and other radio parameters are described in this section.



Wireless Settings ...

These fields provide wireless client settings to this station.

Access Point Essid to Associate	ESSID1
Authentication Algorithm	Open System
Data Encryption Option	Disable
Default Key	1
Key #1	
Key #2	
Key #3	
Key #4	
RTS Threshold	60
Transmit Power Level	Full
Modulation Type and Link Rate	limited 54 Mbps
RF Distance(Km)	20
Regulatory Domain	FCC

GHz\MHz	00	05	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95
4.9	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒
5.0	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒
5.1	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒
5.2	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒	☑	☒	☒	☒	☑	☒	☒	☒
5.3	☑	☒	☒	☒	☑	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒
5.4	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒
5.5	☑	☒	☒	☒	☑	☒	☒	☒	☑	☒	☒	☒	☑	☒	☒	☒	☑	☒	☒	☒
5.6	☑	☒	☒	☒	☑	☒	☒	☒	☑	☒	☒	☒	☑	☒	☒	☒	☑	☒	☒	☒
5.7	☑	☒	☒	☒	☒	☒	☒	☒	☒	☑	☒	☒	☒	☑	☒	☒	☒	☑	☒	☒
5.8	☒	☑	☒	☒	☒	☑	☒	☒	☒	☒	☒	☒	☒	☒						

Access Point ESSID to Associate – The SSID, or wireless network name, of the network you want to connect to. All wireless clients and Access Units in the same network must use the same SSID to associate. The SSID is case sensitive and can consist of up to 31 alphanumeric characters.

Authentication Algorithm – Sets the SU-A-EZ to communicate with an AU-EZ configured as an open system, or as a pre-configured system using static shared keys. (Default: Open System)

- Open System: If you don't set up any other security mechanism on the SU-A-EZ, the network has no protection. This is the default setting.

- Shared Key: Sets the SU-A-EZ to use WEP shared keys. If this option is selected, you must configure at least one key on the SU-A-EZ and AU-EZ.

Data Encryption Option – Enable or disable the SU-A-EZ to use data encryption (WEP). If this option is selected when using static WEP keys, you must configure at least one key on the SU-A-EZ and the AU-EZ. (Default: Disabled)

Default Key – Selects the key number to use for encryption. The key indicated by the default key selection must be configured with the same value in the AP and in the SU-A-EZ in order for the link to work (Default: Key 1.)

WEP Keys – If the wireless network you are connecting to uses WEP security, you need to enter the WEP key provided to you by the network operator.

WEP provides a basic level of security, preventing unauthorized access to the network, and encrypting data transmitted between the SU-A-EZ and AU-EZ. WEP uses static shared keys (fixed-length hexadecimal) that are manually distributed to all clients that want to use the network.

Enter “0x” followed by 32 hexadecimal digits (0 to 9 and A to F) for 152 bit keys.

NOTE

All wireless devices must be configured with the same WEP Key values to communicate with an AU-EZ.

RTS Threshold – Sets the packet size threshold at which a Request to Send (RTS) signal must be sent to a receiving station prior to the sending station starting communications. The SU-A-EZ sends RTS frames to a receiving station to negotiate the sending of a data frame. After receiving an RTS frame, the station sends a CTS (clear to send) frame to notify the sending station that it can start sending data.

If the RTS threshold is set to 20, the SU-A-EZ always sends RTS signals. If set to 2347, the SU-A-EZ never sends RTS signals. If set to any other value, and the packet size equals or exceeds the RTS threshold, the RTS/CTS (Request to Send / Clear to Send) mechanism will be enabled.

The SU-A-EZs contending for the medium may not be aware of each other. The RTS/CTS mechanism can solve this “Hidden Node Problem.” (Range: 20-2347 bytes: Default: 60 bytes)

Transmit Power Level – Adjusts the power of the radio signals transmitted from the SU-A-EZ. The higher the transmission power, the farther the transmission range. Power selection is not just a trade off between coverage area and maximum supported clients. You also have to ensure that high-power signals do not interfere with the operation of other radio devices in the service area. (Options: Full, Half, Quarter, Eighth, Min (0 dBm); Default: Full)

Modulation Type – Sets the modulation type to limited or fixed. (Default: limited)

Link Rate – The maximum data rate at which the SU-A-EZ transmits unicast packets on the wireless interface. The maximum transmission distance is affected by the data rate. The lower the data rate, the longer the transmission distance. (Default: 54 Mbps)

RF Distance (Km) – The maximum data transmission distance. The maximum data rate for a link decreases as the operating range increases. (Default: 1km). The RF Distance should be set to the distance from the access unit of the furthest SU in the cell (up-rounded). Since this parameter affects the time the unit waits for acknowledgement, wromg configuration of its value (too low or too high) may have a very strong negative effect on performance.

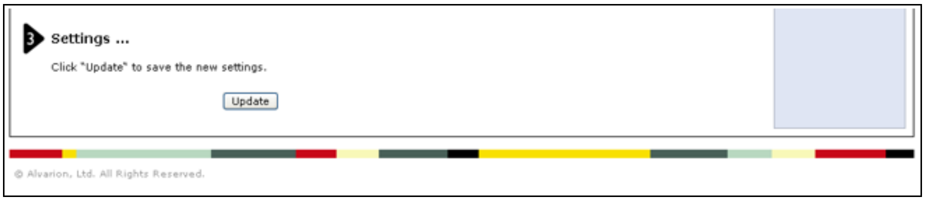
Regulatory Domain – The regulatory domain for the SU-A-EZ is preset for the country of intended operation and may only be configured through the CLI, (see "Regulatory Domain Commands" on page 63.) Within the allowed domain for your country of operation you may limit transmission on certain band frequencies by deselecting the frequency on the grid and updating your settings. For example, deselecting 5.2 GHz 60 MHz, disables the 5.260 GHz frequency.

Select All – Selects all available frequencies in the regulatory domain.

Clear All – De-selects all available frequencies in the regulatory domain (at least one frequency will be retained for security purposes).

4.4 Saving Settings

To save any new settings, click "Update".

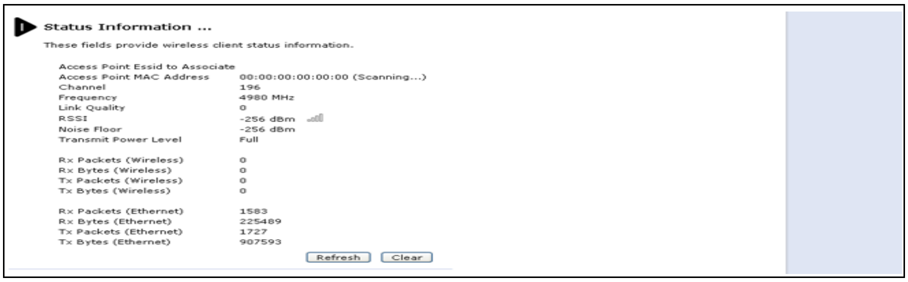


Settings ...

Click "Update" to save the new settings.

4.5 Status Information

The “Review description of this client station” displays basic system configuration settings and traffic counters for the SU-A-EZ.



Status Information ...

These fields provide wireless client status information.

Access Point Essid to Associate	
Access Point MAC Address	00:00:00:00:00:00 (Scanning...)
Channel	196
Frequency	4980 MHz
Link Quality	0
RSSI	-256 dBm
Noise Floor	-256 dBm
Transmit Power Level	Full
Rx Packets (Wireless)	0
Rx Bytes (Wireless)	0
Tx Packets (Wireless)	0
Tx Bytes (Wireless)	0
Rx Packets (Ethernet)	1583
Rx Bytes (Ethernet)	225489
Tx Packets (Ethernet)	1727
Tx Bytes (Ethernet)	907593

Access Point ESSID to Associate – The service set identifier of the network to which the client wants to associate.

Access Point MAC Address – The physical layer address of the AU-EZ. Specified in the form of six pairs of hexadecimal digits separated by colons; for example, 00:10:E7:01:02:03.

Channel – Displays the radio channel through which the SU-A-EZ communicates with the AU-EZ.

Frequency – Displays the frequency at which the SU-A-EZ is transmitting.

Link Quality – Displays the quality of the signal received at the SU-A-EZ.

RSSI – Receive Signal Strength Indicator (RSSI) displays the strength of the received signal, measured in dBm.

Noise Floor – Indicates the level of interference noise above which the received signal must be for successful reception, measured in dBm.

Transmit Power Level – Indicates the power of the radio signals transmitted from the SU-A-EZ.

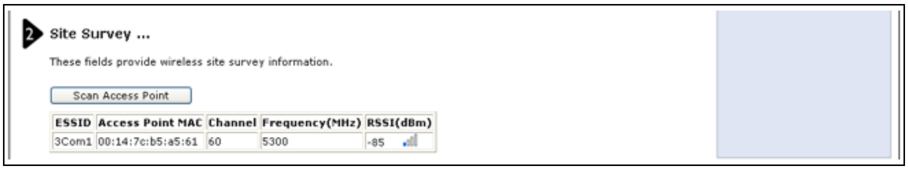
Rx/Tx Packets/Bytes – The number of received (Rx) and transmitted (Tx) data packets/bytes since the unit was last reset or since the counters were cleared.

Refresh – Updates the statistics to the most recent data.

Clear – Resets the Rx/Tx counters to a null value.

4.6 Site Survey

The Site Survey scans the available frequencies for neighboring wireless devices (AU-EZ units) that act as APs (that generate beacons).



Site Survey ...

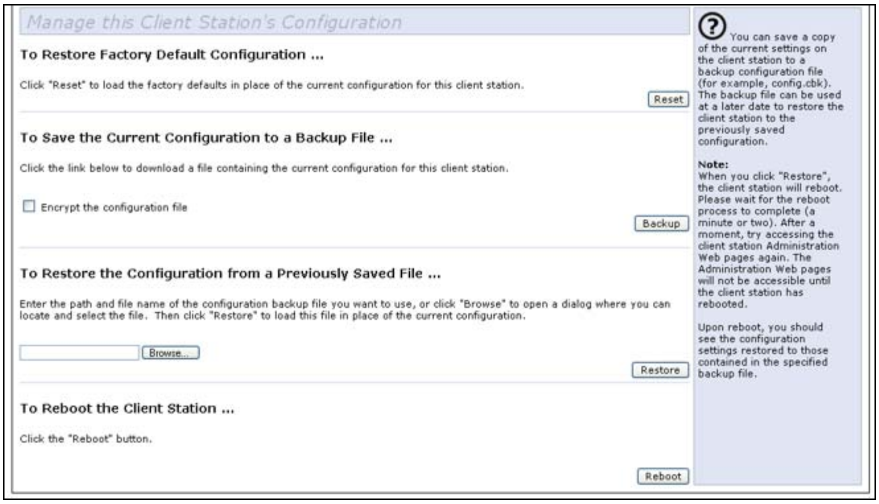
These fields provide wireless site survey information.

ESSID	Access Point MAC	Channel	Frequency(MHz)	RSSI(dBm)
3Com1	00:14:7c:b5:a5:61	60	5300	-85

Scan Access Point – Click this to perform a scan for neighboring wireless devices.

4.7 Managing the SU-A-EZ Configuration

The Maintenance/Configuration page allows you to save and restore the unit’s configuration settings, restore factory defaults, and to reset the unit.



Manage this Client Station's Configuration

To Restore Factory Default Configuration ...

Click "Reset" to load the factory defaults in place of the current configuration for this client station.

To Save the Current Configuration to a Backup File ...

Click the link below to download a file containing the current configuration for this client station.

□ Encrypt the configuration file

To Restore the Configuration from a Previously Saved File ...

Enter the path and file name of the configuration backup file you want to use, or click "Browse" to open a dialog where you can locate and select the file. Then click "Restore" to load this file in place of the current configuration.

To Reboot the Client Station ...

Click the "Reboot" button.

You can save a copy of the current settings on the client station to a backup configuration file (for example, config.cbk). The backup file can be used at a later date to restore the client station to the previously saved configuration.

Note:
When you click "Restore", the client station will reboot. Please wait for the reboot process to complete (a minute or two). After a moment, try accessing the client station Administration Web pages again. The Administration Web pages will not be accessible until the client station has rebooted.

Upon reboot, you should see the configuration settings restored to those contained in the specified backup file.

To Restore Factory Default Configuration – Click the Reset button to set the configuration settings for the SU-A-EZ to the factory defaults and reboot the system. Note that all user configured information will be lost. You will have to re-enter the default user name (admin) and password (private) to re-gain management access to this device.

To Save the Current Configuration to a Backup File – Click the Backup button to download the current SU-A-EZ configuration file to the web management station. Check the Encrypt the configuration file check-box to store the backup configuration file in an encrypted format.

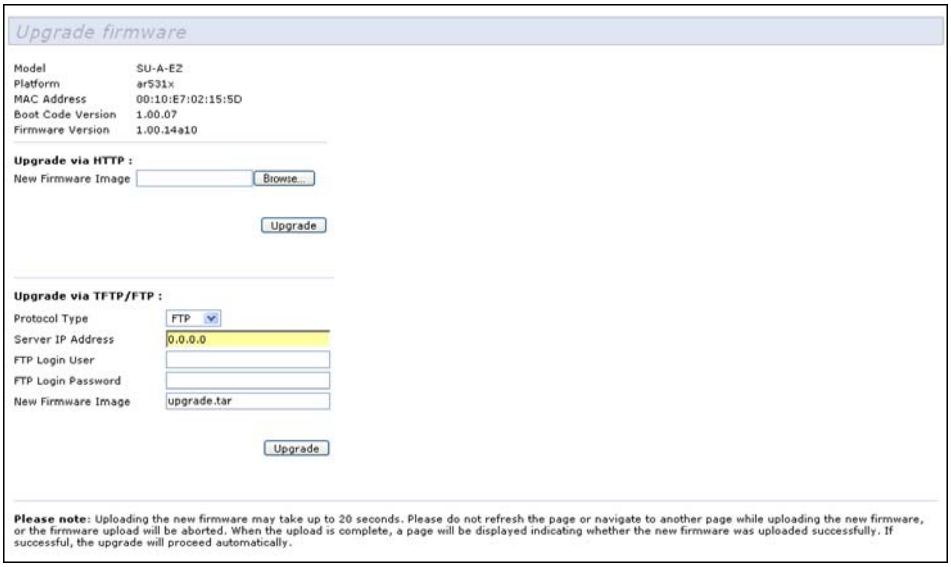
To Restore the Configuration From a Previously Saved File – Sends a saved configuration file on the web management station to the SU-A-EZ to restore a specific configuration. You can use the Browse button to find the configuration file on the local PC. Click the Restore button to replace the current SU-A-EZ configuration.

To Reboot the Client Station – Click the Reboot button to reset the system.

4.8 Upgrading SU-A-EZ Firmware

You can upgrade new SU-A-EZ firmware (often called system software) from a local file on the management workstation.

After upgrading new software, the SU-A-EZ will automatically reboot itself and load the new code.



Upgrade firmware

Model	SU-A-EZ
Platform	ar531x
MAC Address	00:10:E7:02:15:5D
Boot Code Version	1.00.07
Firmware Version	1.00.14a10

Upgrade via HTTP :

New Firmware Image

Upgrade via TFTP/FTP :

Protocol Type	FTP
Server IP Address	0.0.0.0
FTP Login User	
FTP Login Password	
New Firmware Image	upgrade.tar

Please note: Uploading the new firmware may take up to 20 seconds. Please do not refresh the page or navigate to another page while uploading the new firmware, or the firmware upload will be aborted. When the upload is complete, a page will be displayed indicating whether the new firmware was uploaded successfully. If successful, the upgrade will proceed automatically.

Model – Shows the model number of the SU-A-EZ.

Platform – Shows the platform number of the hardware.

MAC Address – Shows the physical address of the SU-A-EZ.

Boot Code Version – Shows the current version number of the boot code.

Firmware Version – Shows the current version number of the runtime code.

Upgrade via HTTP – Downloads an software code image file from the web management station to the SU-A-EZ using HTTP. Use the Browse button to locate the image file locally on the management station and click the Upgrade button to proceed.

Upgrade via TFTP/FTP – Downloads an software code image file from the web management station to the SU-A-EZ using TFTP or FTP.

Protocol Type – Selects either TFTP or FTP.

Server IP Address – Allows you to enter the IP address of the TFTP or FTP server from which to download code.

FTP Login User – Allows you to enter the FTP user name.

FTP Login Password – Allows you to enter the FTP password.

New Firmware Image – Allows you to enter the name of the chosen update file stored on the TFTP/FTP server. Select “Upgrade” to start the download process.

NOTE

Be sure to allow enough time for the firmware download to complete and the unit automatically reboot itself. Typical download time is 5 minutes when the unit is not handling heavy traffic.

Rebooting the unit before completion of the download may damage the software and cause the unit to be inoperative..

5

Chapter 5 - Command Line Interface

In This Chapter:

5.1 Using the Command Line Interface

5.1.1 Accessing the CLI

When accessing the management interface via a Telnet connection, the SU-A-EZ (CPE) unit can be managed by entering command keywords and parameters at the prompt. Using the SU-A-EZ's command-line interface (CLI) is very similar to entering commands on a UNIX system.

5.1.2 Telnet Connection

Telnet operates over the IP transport protocol. In this environment, your management station and any network device you want to manage over the network must have a valid IP address. Valid IP addresses consist of four numbers, 0 to 255, separated by periods. Each address consists of a network portion and host portion. For example, if the SU-A-EZ cannot acquire an IP address from a DHCP server, the default IP address used by the CPE, 10.0.0.1, consists of a network portion (10) and a host portion (0.0.1).

To access the SU-A-EZ through a Telnet session, you must first use the default IP address 10.0.0.1.

To open a Telnet session:

1. From the remote host, enter the Telnet command and the IP address of the device you want to access.
2. At the prompt, enter the user name and system password for the command mode that you wish to enter. There are two command modes: admin mode and installer mode. Admin mode allows you to configure most settings with the exception of the regulatory domain. The regulatory domain may be configured through the installer mode only.
3. The CLI will display the prompt for the mode you enter, for example Installer# to show that you are using the Installer user account and ClientSta# for priviledged access mode.
4. Enter the necessary commands to complete your desired tasks.
5. When finished, exit the session with the “exit” command.

After entering the Telnet command, the login screen is displayed:

```
ClientSta login: installer
Password: *********
Installer#
```

CAUTION

You can open up to four sessions to the device via Telnet.

5.2 Entering Commands

This section describes how to enter CLI commands.

5.2.1 Minimum Abbreviation

The CLI does not accept incomplete commands. For example, the command "addfreq" can not be entered as **add**. In exchange, you can get hints from the CLI by entering "add" folowed by TAB key. If an entry is ambiguous or incorrect, the system will not prompt for further input, nor inform you if you have entered incorrect syntax.

5.2.2 Command Completion

If you terminate input with a Tab key, the CLI will print the remaining characters of a partial keyword up to the point of ambiguity. In the “configure” example, typing **ex** followed by a tab will result in printing the command up to “**exit**.”

5.2.3 Getting Help on Commands

You can display a brief description of the help system by pressing the tab key twice at the command prompt.

Example

```
ClientSta#
addfreq        Add Frequency
delfreq        Delete Frequency
dynamicfreq    Set Exactly Frequency
exit           Logout the system
get            Get property values of the running configuration
getfreq        Get Current Frequency
ping
reboot         Reboot the system
save-running   Save the running configuration
set            Set property values of the running configuration
```

The help system may show additional detail by adding a term to query and then pressing the tab key twice, for example “set” followed by a double tab displays all parameters associated with this command set only.

Example

```
Installer# set
CStatus     status class
ClientSta   client station
config      Configuration settings
system      System settings
tftpftp     tftpftp class
Installer# set
```

Furthermore, adding an additional term displays more help system results, for example entering “set ClientSta” followed by a double tab displays all parameters associated with this command subset only.

Example

```
Installer# set ClientSta
authentication          authentication algorithm
bridge-mip              bridge ip mask
bridge-static-ip        bridge ip
data-encryption-option  data encryption option
default-gw              default gateway
default-key             default key
dhcpc                   DHCP client
distance                wireless RF distance
key-1                   wep key string #1
key-2                   wep key string #2
key-3                   wep key string #3
key-4                   wep key string #4
linkrate                link rate
mangVLAN                management VLAN
modulation              modulation type
rtsthreshold            RTS threshold
snmp-rocommunity        SNMP read-only community
status-update           status of station
txpowerlevel            TxPower Level
wireless-essid          essid
Installer#
```

5.2.4 Partial Keyword Lookup

If you terminate a partial keyword with pressing the tab key twice, alternatives that match the initial letters are provided. (Remember not to leave a space between the command and tab keys.) For example "**s<Tab><Tab>**" shows all the keywords starting with “s.”

```
Installer# s
save-running   Save the running configuration
set            Set property values of the running configuration
Installer# s
```

5.2.5 Using Command History

The CLI maintains a history of commands that have been entered. You can scroll back through the history of commands by pressing the up arrow key. Any command displayed in the history list can be executed again, or first modified and then executed.

5.2.6 Command Line Processing

Commands are case sensitive. You can abbreviate commands and parameters as long as they contain enough letters to differentiate them from any other currently available commands or parameters. You can use the Tab key to complete partial commands. You can also use the following editing keystrokes for command-line processing:

Table 5-2: Keystroke Commands

Keystroke	Function
Ctrl-A	Shifts cursor to start of command line.
Ctrl-B	Shifts cursor to the left one character.
Ctrl-C	Terminates a task and displays the command prompt.
Ctrl-E	Shifts cursor to end of command line.
Ctrl-F	Shifts cursor to the right one character.
Ctrl-K	Deletes from cursor to the end of the command line.
Ctrl-L	Repeats current command line on a new line.
Ctrl-N	Enters the next command line in the history buffer.
Ctrl-P	Shows the last command.
Ctrl-U	Deletes the entire line.
Ctrl-W	Deletes the last word typed.
Delete key or backspace key	Erases a mistake when entering a command.

5.3 General Commands

Table 5-3: General Commands

Command	Function	Mode	Page
exit	Logs out of the current session.	Installer; Admin	60
ping	Sends a ping signal to test for connectivity.	Installer; Admin	60
reboot	Reboots the unit.	Installer; Admin	62

5.3.1 exit

The "exit" command allows you to log out of the current session.

Syntax

exit

Default Setting

None

Command Mode

Installer, Admin

Example

This example shows how to logout of the current session:

```
Installer#exit
ClientSta login:
```

5.3.2 ping

This command sends ICMP echo request packets to another node on the network.

Syntax

ping <*ip_address*>

- *ip_address* - IP address of the host.

Default Setting

None

Command Mode

Installer, Admin

Command Usage

- Use the ping command to see if another site on the network can be reached.
- The following are some results of the ping command:

  - A normal response occurs in one to ten seconds, depending on network traffic. It details how many bytes were received, and the time taken from sending the request to the response.
  - If the host does not respond the screen returns a blank and continues sending a ping request until it is manually stopped by the user with the CTRL+C command. After typing this command a summary is displayed describing packets transmitted, packets received and percentage of packet loss.
  - If the gateway for the destination is unreachable, or if it found no corresponding entry in the route table, a "*Network is unreachable"* message will display.
- Press <Ctrl-C> to stop pinging.

Example 1

```
Installer# ping 10.0.0.1
PING 10.0.0.1 (10.0.0.1): 56 data bytes
64 bytes from 10.0.0.1: icmp_seq=0 ttl=64 time=0.4 ms
64 bytes from 10.0.0.1: icmp_seq=1 ttl=64 time=0.3 ms
64 bytes from 10.0.0.1: icmp_seq=2 ttl=64 time=0.3 ms
64 bytes from 10.0.0.1: icmp_seq=3 ttl=64 time=0.3 ms
64 bytes from 10.0.0.1: icmp_seq=4 ttl=64 time=0.3 ms
64 bytes from 10.0.0.1: icmp_seq=5 ttl=64 time=0.3 ms

--- 10.0.0.1 ping statistics ---
6 packets transmitted, 6 packets received, 0% packet loss
round-trip min/avg/max = 0.3/0.3/0.4 ms
Installer#
```

Example 2

```
Installer# ping 10.0.0.23

--- 10.0.0.23 ping statistics ---
78 packets transmitted, 0 packets received, 100% packet loss
Installer#
```

Example 3

```
Installer# ping 192.168.2.1
PING 192.168.2.1 (192.168.2.1): 56 data bytes
ping: sendto: Network is unreachable
Installer#
```

5.3.3 reboot

This command restarts the system.

Syntax

reboot

Default Setting

None

Command Mode

Installer, Admin

Command Usage

When the system is restarted, it will always run the Power-On Self-Test.

Example

This example shows how to reset the system:

```
Installer#reboot
```

5.4 Regulatory Domain Commands

Before transmitting wireless data from the unit, you should determine the correct regulatory domain setting for the country in which you are operating the SU-A-EZ.

Table 5-4: Regulatory Domain Commands

Command	Function	Mode	Page
regdomain	Allows you to select what regional domain to set.	Installer	63
addfreq	Adds one or more individual frequencies or a range of frequencies within the band allowed by the chosen regulatory domain.	Installer; Admin	64
dynamicfreq	Configures one or more frequencies or a range of frequencies within the band allowed by the chosen regulatory domain (old setting are overwriten).	Installer, Admin	65
delfreq	Deletes one or more individual frequencies or a range of frequencies.	Installer; Admin	66
getfreq	Displays the currently used frequencies.	Installer; Admin	66

5.4.1 regdomain

This command allows you to set the regulatory domain in which the SU-A-EZ will be used. After selecting the required domain, the unit must be rebooted for changes to take effect.

WARNING

You must select the regulatory domain that is legally permissable for the country in which you intend to operate the SU-A-EZ.

Syntax

regdomain <**FCC** | **ETSI** | **UK** | **JAPAN** | **Universal** | **WLG**>

- **FCC -** Federal Communications Commission.
- **ETSI -** European Telecommunications Standards Institute.
- **UK -** United Kingdom.
- **JAPAN -** Japan.
- **Universal -** For a testing environment only. Do not select for wireless transmission of data outside of a test environment. This selects all frequencies in the 802.11a bandwidth.
- **WLG -** White Logo: may be customized to a domain other than those stated above. Access restricted.

Default Setting

Universal

Command Mode

Installer

Example

This example shows how to display all possible regulatory domains by entering the syntax “regdomain” followed by the RETURN key, followed by selecting the ‘FCC’ domain by entering the syntax “regdomain FCC”.

```
Installer# regdomain
Usage :
        regdomain [FCC | ETSI | UK | JAPAN | Universal | WLG]
Installer# regdomain FCC
Installer# reboot
....
```

5.4.2 addfreq

This command allows you to add individual frequencies and/or frequency ranges within the band allowed by the chosen regulatory domain.

Syntax

addfreq *<f1 | f2 | f3-f4>*

- *f1, f2* - Specify the frequencies you wish to add to the regulatory domain, in MHz, i.e. for the frequency 5.500 GHz type 5500, where the final three digits represent the space after the decimal point.
- *f3-f4* - A frequency range may be entered by separating two frequencies with a “-”, for example type ‘5500-5560’, to select the range from 5.500GHz to 5.560GHz.

Default Setting

None

Command Mode

Installer, Admin

Example

In this example the command is entered and the following help is displayed by pressing the ‘enter’ key. The frequency 5.520GHz is then added to the regulatory domain. Use the getfreq command to display all selected frequencies.

```
Installer# addfreq
Usage :
        addfreq [f1,f2,f3-f4...]
Installer#
Installer# addfreq 5520
Installer#
```

5.4.3 dynamicfreq

This command allows you to add one or more individual frequencies and a range of frequencies, allowed by the chosen regulatory domain.

Syntax

dynamicfreq <*f1,f2,f3-f4*>

- *f1,f2,f3-f4* - Specify the individual frequencies and/or frequency ranges that you wish to add to the already configured scanning frequency list, in MHz, separated by comas and no spaces. For a frequency range separate the beginning and ending frequencies with a "-", i.e. for the frequencies 5.26GHz, 5.54GHz, and the range 5.7~5.785 type '5260,5540,5700-5785', where the final three digits represent the space after the decimal point.

Default Setting

None

Command Mode

Installer, Admin

Example

In this example the frequencies 5.260GHz, 5.540GHz, and 5.700GHz to 5.785GHz are added within the band allowed by the chosen regulatory domain FCC. The getfreq command is then used to display all selected frequencies.

```
Installer# dynamicfreq 5260,5540,5700-5785
...
Installer# getfreq
...
5260,5540,5700,5745,5765,5785
Installer#
```

5.4.4 delfreq

This command allows you to delete one or more individual frequencies and/or ranges of frequencies within a band allowed by the chosen regulatory domain.

Syntax

delfreq <*f1* | *f2* | *f3-f4*>

- *f1, f2* - Specify the frequencies you wish to remove within a band allowed by the chosen regulatory domain, in MHz, i.e. for the frequency 5.5GHz type 5500, where the final three digits represent the space after the decimal point.
- *f3-f4* - A frequency range may be entered by separating two frequencies with a “-”, for example type ‘5500-5560’, to select the range from 5.5GHz to 5.56GHz.

Default Setting

None

Command Mode

Installer, Admin

Example

In this example the frequency 5.500GHz is deleted from the frequency range.

```
Installer# delfreq 5500
Installer#
```

5.4.5 getfreq

This command allows you to display all selected frequencies in the chosen regulatory domain.

Syntax

getfreq

Default Setting

None

Command Mode

Installer, Admin

Example 1

This example shows how to display all selected frequencies in the regulatory domain ETSI:

```
Installer# getfreq
5520,5540,5560,5580,5600,5620,5640,5660,5680,5700
Installer#
```

Example 2

This example shows how to use the addfreq command to add a frequency, the delfreq command to remove another frequency, and the getfreq command to display the updated list of frequencies:

```
Installer# addfreq 5500
Installer# delfreq 5600
Installer# getfreq
5500,5520,5540,5560,5580,5620,5640,5660,5680,5700
Installer#
```

5.5 Password Commands

After initially logging onto the system, you should set a new password for both Admin and Installer modes. Remember to record your passwords in a safe place.

Table 5-5: Password Commands

Command	Function	Mode	Page
set system password	Specifies the password for management access to the Admin account.	Admin	68
passwd	Specifies the password for management access to the Installer account.	Installer	69

5.5.1 set system password

This command changes the password for Admin mode.

Syntax

set system password <*password*>

- *password* - A string (Range:1~32 printable characters).

Default Setting

"private"

Command Mode

Admin

Example

```
Admin# set system password a-good-secret
Admin#
```

5.5.2 passwd

This command changes the password for Installer mode. After entering the command you will be prompted to enter the new password twice. The password may be 5~8 characters, using upper and lower case letters and numbers, with no spaces, nor comas.

Syntax

passwd

Default Setting

"installer"

Command Mode

Installer

Example

```
Installer# passwd
Changing password for installer
Enter the new password (minimum of 5, maximum of 8 characters)
Please use a combination of upper and lower case letters and numbers.
Enter new password:*********
Re-enter new password:*********
Password changed.
Write Config Area ...Finished!
Installer#
```

5.6 File Commands

Table 5-6: File Commands

Command	Function	Mode	Page
save-running	Saves the current running configuration.	Installer; Admin	71
set config default	Reboots the system and restores factory default settings.	Installer, Admin	71
set ClientSta status-update	Enables/disables the recording of system status updates in memory.	Installer, Admin	71
set tftpftp ftppass	Sets the FTP password.	Installer, Admin	72
set tftpftp ftpuser	Sets the FTP user name.	Installer, Admin	72
set tftpftp ptype	Selects the method used for file transfer.	Installer, Admin	73
set tftpftp rfile	Sets the name of the file for upgrade.	Installer, Admin	73
set tftpftp sip	Sets the IP address of the FTP or TFTP server.	Installer, Admin	73
set tftpftp start	Starts the file upgrade process.	Installer, Admin	74
get tftpftp	Displays detailed information about FTP or TFTP settings.	Installer, Admin	74
get config	Displays detailed configuration information for the system.	Installer, Admin	75
get interface	Displays interface information.	Installer, Admin	76
get system	Displays the SU-A-EZ’s hardware and software versions.	Installer, Admin	76
get ClientSta	Displays detailed system information about the SU-A-EZ.	Installer, Admin	78

5.6.1 save-running

This command allows you to save the running configuration to flash memory, so that after a reboot the current configuration will be restored.

Syntax

save-running

Default Setting

No

Command Mode

Installer, Admin

```
Installer# save-running
Installer#
```

5.6.2 set config default

This command restores the factory default settings and restarts the system.

Syntax

set config default <**yes** | **no**>

- **yes** - Resets settings to the factory default and reboots the system.
- **no** - Takes no action.

Default Setting

no

Command Mode

Installer, Admin

Example

```
Installer# set config default yes
Installer#
```

5.6.3 set ClientSta status-update

This command enables/disables the saving of any changes to the running configuration, in the SDRAM. Disabling this feature will result in all changes to the running configuration being voided. If enabled, when the user has finished making changes, the running configuration may then be saved to flash memory using the “save-running” command.

Syntax

set ClientSta status-update <**yes** | **no**>

- **yes** - Enables recording updates to memory.
- **no** - No action.

Default Setting

no

Command Mode

Installer, Admin

Example

```
Installer# set ClientSta status-update yes
Installer#
```

5.6.4 set tftpftp ftppass

Sets the password for FTP software upgrading.

Syntax

set tftpftp ftppass <*password*>

- *password* - Alphanumeric string (Range: up to 36 characters).

Default Setting

Disabled

Command Mode

Installer, Admin

Example

```
Installer# set tftpftp ftppass unforgetable
Installer#
```

5.6.5 set tftpftp ftpuser

Sets the user name for FTP software upgrading.

Syntax

set tftpftp ftpuser <*username*>

- *username* - Alphanumeric string (Range: up to 36 characters).

Default Setting

Disabled

Command Mode

Installer, Admin

Example

```
Installer# set tftpftp ftpuser David
Installer#
```

5.6.6 set tftpftp ptype

Selects FTP or TFTP for file transfer.

Syntax

set tftpftp ptype <**ftp** | **tftp**>

- **ftp** - Selects FTP.
- **tftp** - Selects TFTP.

Default Setting

tftp

Command Mode

Installer, Admin

Example

```
Installer# set tftpftp ptype ftp
Installer#
```

5.6.7 set tftpftp rfile

Specifies the name of the code file on the server. The new firmware file name should not contain slashes (\ or /), the leading letter of the file name should not be a period (.). (Valid characters: A-Z, a-z, 0-9, “.”, “-”, “_”)

Syntax

set tftpftp rfile <*file*>

- *file* - The name of the file for transfer.

Default Setting

upgrade.tar

Command Mode

Installer, Admin

Example

```
Installer# set tftpftp rfile 1.00.14.tar
Installer#
```

5.6.8 set tftpftp sip

IP address of FTP or TFTP server.

Syntax

set tftpftp sip <*IP address*>

- *IP address* - IP address specified in the form xxx.xxx.xxx.xxx.

Default Setting

0.0.0.0

Command Mode

Installer, Admin

Example

```
Installer# set tftpftp sip 192.168.0.0
Installer#
```

5.6.9 set tftpftp start

Commences the FTP or TFTP file transfer process.

Syntax

set tftpftp start <**yes** | **no**>

- **yes** - Commences the file transfer process.
- **no** - Takes no action.

Default Setting

Disabled

Command Mode

Installer, Admin

Example

```
Installer# set tftpftp start yes
Installer#
```

5.6.10 get tftpftp

This command displays detailed TFTP or FTP configuration information.

In addition, instead of listing all display parameters, a specific parameter relative to the configuration may be specified by adding syntax after the command, i.e. get tftpftp ptype.

Syntax

get tftpftp <**detail** | *parameter*>

- **detail** - Use to display all parameters for this command.
- *parameter* - Optional parameter used to narrow the query result (see example below).

Default Setting

None

Command Mode

Installer, Admin

Example 1

```
Installer# get tftpftp detail
Property  Value
---------------------
ptype     tftp
rfile     upgrade.tar
sip       0.0.0.0
ftpuser
ftppass
start     no
Installer#
```

Example 2

```
Installer# get tftpftp ptype
tftp
Installer#
```

5.6.11 get config

This command displays detailed configuration information for the system.

Syntax

get config

get config <**default** | **startup**| **version**>

- **default** - Displays if the configuration will reset to the default setting after the next reboot.
- **version** - Displays the current configuration version file number.

Default Setting

None

Command Mode

Installer, Admin

Example 1

```
Installer# get config
Property  Value
---------------
default   no
version   1.02
Installer#
```

Example 2

```
Installer# get config default
no
Installer#
```

5.6.12 get interface

This command displays the interface information for all connections.

Syntax

get interface <**all** | **br0** | **lo**>

- **all** - Use to display all parameters for this command.
- **br0** - Displays interface information about the SU-A-EZ.
- **lo** - Displays loopback interface information.

Default Setting

None

Command Mode

Installer, Admin

Example 1

```
Installer# get interface all
name  type      status  mac                ip          mask
---------------------------------------------------------------
br0   bridge    up      00:10:E7:02:15:5D  10.0.0.1    255.0.0.0
lo    loopback  up      00:00:00:00:00:00  127.0.0.1   255.0.0.0
Installer#
```

Example 2

```
Installer# get interface lo
Property  Value
---------------------------
type      loopback
status    up
mac       00:00:00:00:00:00
ip        127.0.0.1
mask      255.0.0.0
Installer#
```

5.6.13 get system

This command displays detailed hardware and software information for the system.

Syntax

get system <**detail** | **model** | **bversion** | **version** | **platform**>

- **detail** - Use to display all parameters for this command.
- **model -** The SU-A-EZ model number.
- **bversion -** The boot code version number.
- **version -** The software version number.
- **platform -** The design version for integrating software and hardware.

Default Setting

None

Command Mode

Installer, Admin

Example 1

```
Installer# get system detail
Property  Value
-------------------
model     SU-A-EZ
bversion  1.00.07
version   1.00.14
platform  ar531x
Installer#
```

Example 2

```
Installer# get system platform
ar531x
Installer#
```

5.6.14 get ClientSta

This command allows you to display detailed information about the SU-A-EZ.

Syntax

get ClientSta <**detail** | **status-update** | **wireless-essid** | **authentication** | **data-encryption-option** | **wep-key-input** | **wep-key-type** | **default-key** | **key-1** | **key-2** | **key-3** | **key-4** | **rtsthreshold** | **modulation** | **linkrate** | **bridge-static-ip** | **bridge-mip** | **default-gw** | **regdomain** | **total-channel** | **mangVLAN** | **txpowerlevel** | **distance** | **dhcp** | **snmp-rocommunity**>

- **detail** - Use to display all parameters for this command.
- **status-update** - Notifies the user if a system status update has been recorded.
- **wireless-essid** - Displays the service set identifier used to identify wireless traffic.
- **authentication** - Displays the type of authentication used.
- **data-encryption-option** - Notifies the user if data encryption is being used on transmitting data.
- **wep-key-input** - Displays if WEP security is being used.
- **wep-key-type** - Displays the type of WEP security being used, if any.
- **default-key** - Displays the default WEP key.
- **key-1**~**key-4** - Displays the WEP key value.
- **rtsthreshold** - Displays the set packet size threshold after which an RTS packet must be sent.
- **modulation** - Displays the method at which data is being transferred in relation to the linkrate, fixed or dynamic (limited).
- **linkrate** - Displays the maximum data rate at which the SU-A-EZ can transmit data.
- **bridge-static-ip** - Displays the IP address of the SU-A-EZ.
- **bridge-mip** - Displays the subnet mask for the Ethernet connection.
- **default-gw** - Displays the default gateway for the Ethernet connection.
- **regdomain** - Displays the chosen regulatory domain.
- **total-channel** - Displays the number of channels of bandwidth enabled within the chosen regulatory domain.
- **mangVLAN** - Displays the ID of the management VLAN.
- **txpowerlevel** - Displays the transmission power level in relation to maximum capabilities.
- **distance** - Displays the configured distance between the SU-A-EZ's antenna and the AP.
- **dhcp** - Displays if DHCP has been enabled.
- **snmp-rocommunity** - Displays the SNMP read-only community access string.

Default Setting

None

Command Mode

Installer, Admin

Example 1

```
Installer# get ClientSta detail
Property                Value
----------------------------------
status-update           no
wireless-essid          ESSID1
authentication          OpenSystem
data-encryption-option  no
wep-key-input           NONE WEP
wep-key-type            NONE WEP
default-key             1
key-1
key-2
key-3
key-4
rtsthreshold            60
modulation              limited
linkrate                54
bridge-static-ip        10.0.0.1
bridge-mip              255.0.0.0
default-gw              0.0.0.0
regdomain               ETSI
total-channel           10
mangVLAN                0
txpowerlevel            Full
distance                20
dhcpc                   no
snmp-rocommunity        public
Installer#
```

Example 2

```
Installer# get ClientSta modulation
limited
Installer#
```

5.7 SNMP Commands

Table 5-7: SNMP Commands

Command	Function	Mode	Page
set ClientSta snmp -rocommunity	Defines the SNMP read-only access string.	Installer, Admin	80

5.7.1 set ClientSta snmp-rocommunity

This command defines the SNMP community access string that has read-only access. Authorized management stations are only able to retrieve MIB objects.

Syntax

set ClientSta snmp-rocommunity <*string*>

- *string* - 1~32 alphanumeric characters.

Default Setting

"public"

Command Mode

Installer, Admin

Example

```
Installer# set ClientSta snmp-rocommunity monkeys
Installer#
```

5.8 Ethernet Interface Commands

The commands described in this section configure connection parameters for the Ethernet port.

Table 5-8: Ethernet Interface Commands

Command	Function	Mode	Page
set ClientSta bridge-mip	Sets the subnet mask for the unit.	Installer, Admin	81
set ClientSta bridge-static-ip	Sets the IP address for the unit.	Installer, Admin	81
set ClientSta default-gw	Sets the default gateway for passing traffic to the unit.	Installer, Admin	82
set ClientSta dhcpc	Enables/disables DHCP on the unit.	Instaler, Admin	82

5.8.1 set ClientSta bridge-mip

This command sets the subnet mask for the interface.

Syntax

set ClientSta bridge-mip <*subnet mask*>

- *subnet mask* - The mask that identifies the host address bits used for routing to specific subnets. Specified as four decimal numbers, 0 to 255, separated by periods

Default Setting

255.0.0.0

Command Mode

Installer, Admin

Example

```
Installer# set ClientSta bridge-mip 255.255.255.0
Installer#
```

5.8.2 set ClientSta bridge-static-ip

This command sets the IP address for the interface.

Syntax

set ClientSta bridge-static-ip <*IP address*>

- *IP address* - The IP address of the unit. Specified as four decimal numbers, 0 to 255, separated by periods

Default Setting

10.0.0.1

Command Mode

Installer, Admin

Example

```
Installer# set ClientSta bridge-static-ip 192.168.1.1
Installer#
```

5.8.3 set ClientSta default-gw

This command sets the IP address of the gateway router between this device and management stations that exist on other network segments.

Syntax

set ClientSta default-gw <*gateway IP address*>

- *gateway IP address* - The IP address of the gateway router. Specified as four decimal numbers, 0 to 255, separated by periods

Default Setting

0.0.0.0

Command Mode

Installer, Admin

Example

```
Installer# set ClientSta default-gw 192.168.0.0
Installer#
```

5.8.4 set ClientSta dhcpc

This command enables the SU-A-EZ to obtain an IP address from a DHCP server. DHCP is disabled by default. To set a new IP address you must first either enable DHCP, or enter it manually using the “set ClientSta bridge-static-ip” command.

Syntax

set ClientSta dhcpc <**yes** | **no**>

- **yes** - Enables DHCP.
- **no** - Disables DHCP.

Default Setting

Disabled

Command Mode

Installer, Admin

Example

```
Installer# set ClientSta dhcpc yes
Installer#
```

5.9 Wireless Commands

The commands described in this section configure connection parameters for the wireless interfaces.

Table 5-9: Wireless Commands

Command	Function	Mode	Page
set ClientSta authentication	Defines the 802.11 authentication type allowed by the SU-A-EZ.	Installer, Admin	84
set ClientSta data-encryption-option	Enables/disables data encryption.	Installer, Admin	84
set ClientSta default-key	Sets the key number for transmission.	Installer, Admin	85
set ClientSta distance	Sets the estimated distance between the farthest SU-A-EZ in the cell and the serving AP.	Installer, Admin	85
set ClientSta key-1~4	Allows the user to set up to 4 152-bit hexadecimal keys.	Installer, Admin	85
set ClientSta linkrate	Sets the maximum data rate for transmission of wireless packets.	Installer, Admin	86
set ClientSta mangVLAN	Sets the management VLAN ID.	Installer, Admin	86
set ClientSta modulation	Sets a fixed or dynamic data transmission rate.	Installer, Admin	87
set ClientSta rtsthreshold	Sets the packet size threshold at which an RTS must be sent to the receiving station prior to the sending station starting communications.	Installer, Admin	87
set ClientSta txpowerlevel	Adjusts the power of the radio signals from the SU-A-EZ.	Installer, Admin	88
set ClientSta wireless-essid	Allows the user to specify an SSID for the SU-A-EZ.	Installer, Admin	89
get BSSList	Shows the wireless APs available in the neighborhood.	Installer; Admin	89
set CStatus clear-cnt yes	Sets all Rx/Tx display statistics to a null value.	Installer, Admin	90
get CStatus	Shows the status for the wireless interface.	Installer, Admin	90

5.9.1 set ClientSta authentication

This command defines the 802.11 authentication type allowed by the SU-A-EZ.

Syntax

set ClientSta authentication <**OpenSystem** | **SharedKey**>

- **OpenSystem** - Can associate to an AU-EZ without verifying its identity using a shared key. “Open” authentication means either there is no encryption (if encryption is disabled) or WEP-only encryption is used (if encryption is enabled).
- **SharedKey** - Authentication is based on a shared key that has been distributed to all stations.

Default Setting

OpenSystem

Command Mode

Installer, Admin

Example

```
Installer# set ClientSta authentication SharedKey
Installer#
```

5.9.2 set ClientSta data-encryption-option

This command enables or disables the SU-A-EZ to use data encryption (WEP). If this option is selected when using static WEP keys, you must configure at least one key on the SU-A-EZ.

Syntax

set ClientSta data-encryption-option <**yes** | **no**>

- **yes** - Enables data encryption.
- **no** - Disables data encryption.

Default Setting

Disabled

Command Mode

Installer, Admin

Example

```
Installer# set ClientSta data-encryption-option yes
Installer#
```

5.9.3 set ClientSta default-key

This command selects the key number to use for encryption. The key indicated by the default key selection must be configured with the same value in the AP and in the SU-A-EZ in order for the link to work.

Syntax

set ClientSta default-key <**1** | **2** | **3** | **4**>

- The key may be a number between 1 and 4.

Default Setting

1

Command Mode

Installer, Admin

Example

```
Installer# set ClientSta default-key 2
Installer#
```

5.9.4 set ClientSta distance

This command allows the user to configure the estimated distance between the AP and the farthest SU-A-EZ in the cell.

Syntax

set ClientSta distance <*distance*>

- *distance* - The distance between antennas in the range 1~50 km.

Default Setting

1 km

Command Mode

Installer, Admin

Example

```
Installer# set ClientSta distance 25
Installer#
```

5.9.5 set ClientSta key

This command defines hexadecimal WEP encryption keys on the SU-A-EZ. Up to four keys may be entered.

Syntax

set ClientSta <**key-1** | **key-2** | **key-3** | **key-4**> <*hex*>

- **key-1 ~ key-4** - Selects the key number to use for encryption.
- *hex* - Enter keys as “0x” followed by 32 hexadecimal digits (0-9 and A-F) for 152 bit keys.

Default Setting

Null

Command Mode

Installer, Admin

Example

```
Installer# set ClientSta key-1  0x12345678901234567890123456789012
Installer#
```

5.9.6 set ClientSta linkrate

This command sets the maximum data rate at which the SU-A-EZ transmits unicast packets on the wireless interface. The maximum transmission distance is affected by the data rate. The lower the data rate, the longer the transmission distance.

Syntax

set ClientSta linkrate <*linkrate*>

- *linkrate* - May be set to 6, 9, 12, 18, 24, 36, 48 or 54 Mbps.

Default Setting

54 Mbps

Command Mode

Installer, Admin

Example

```
Installer# set ClientSta linkrate 6
Installer#
```

5.9.7 set ClientSta mangVLAN

This command configures the management VLAN ID. The management VLAN is for managing the SU-A-EZ. The data traffic is bridged transparently regardless of this setting.

Syntax

set ClientSta mangVLAN <*VLAN ID*>

- *VLAN ID* - Range 0, or 1~4094. 0 implies that the management VLAN is disabled.

Default Setting

Disabled

Command Mode

Installer, Admin

Example

```
Installer# set ClientSta mangVLAN 4094
Installer#
```

5.9.8 set ClientSta modulation

This command allows you to set fixed or dynamic (limited) transmission rate. If the modulation is set to fixed, the data transmission rate will be set by the link rate. However if the modulation is set to dynamic, the transmission rate may be less than or equal to, but not greater than the link rate.

Syntax

set ClientSta modulation <**fixed** | **limited**>

- **fixed** - Data transmission will be set by the linkrate.
- **limited** - Modulation will be dynamic according to requirements, i.e. if the linkrate is set to 24 Mbps, and the modulation is set to limited, then the data transmission rate could be 6 Mbps, 9 Mbps, 12 Mbps, 18 Mbps, or 24 Mbps.

Default Setting

Limited

Command Mode

Installer, Admin

Example

```
Installer# set ClientSta modulation fixed
Installer#
```

5.9.9 set ClientSta rtsthreshold

This command sets the packet size threshold at which a Request to Send (RTS) signal must be sent to the receiving station prior to the sending station starting communications.

Syntax

set ClientSta rtsthreshold <*threshold*>

- *threshold* - Threshold packet size for which to send an RTS. (Range: 20-2347 bytes)

Default Setting

60

Command Mode

Installer, Admin

Command Usage

If the threshold is set to 20, the SU-A-EZ always sends RTS signals. If set to 2347, the SU-A-EZ never sends RTS signals. If set to any other value, and the packet size equals or exceeds the RTS threshold, the RTS/CTS (Request to Send / Clear to Send) mechanism will be enabled.

The SU-A-EZ sends RTS frames to a receiving station to negotiate the sending of a data frame. After receiving an RTS frame, the station sends a CTS frame to notify the SU-A-EZ that it can start sending data.

SU-A-EZs contending for the wireless medium may not be aware of each other. The RTS/CTS mechanism can solve this “Hidden Node” problem.

Example

```
Installer# set ClientSta rtsthreshold 20
Installer#
```

5.9.10 set ClientSta txpowerlevel

This command adjusts the power of the radio signals transmitted from the SU-A-EZ. The higher the transmission power, the farther the transmission range. Power selection is not just a trade off between coverage area and maximum supported clients. You also have to ensure that high-power signals do not interfere with the operation of other radio devices in the service area. The “full” transmission power level corresponds to the maximum power level allowed for the currently used regdomain setting.

Syntax

set ClientSta txpowerlevel <**Full** | **Half** | **Quarter** | **Eighth** | **Min**>

- **Full** - 100% of maximum transmission power level.
- **Half** - 50% of maximum transmission power level.
- **Quarter** - 25% of maximum transmission power level.
- **Eighth** - 12.5% of maximum transmission power level.
- **Min** - Minimum transmission power level (0 dBm).

Default Setting

Full

Command Mode

Installer, Admin

Example

```
Installer# set ClientSta txpowerlevel Min
Installer#
```

5.9.11 set ClientSta wireless-essid

This command allows the user to set the name of the wireless network.

Syntax

set ClientSta wireless-essid <*SSID string*>

- *SSID string* - 1~31 alphanumeric characters.

Default Setting

ESSID1

Command Mode

Installer, Admin

Example

```
Installer# set ClientSta wireless-essid Alvarion1
Installer#
```

5.9.12 get BSSList

This command shows all 802.11a wireless devices that act as AP's (transmit beacons) within the proximity of the SU-A-EZ. Note, the SU-A-EZ can only connect to the AU-EZ.

Syntax

get BSSList

get BSSList <**essid** | **apmac** | **channel** | **freq** | **rssi** >

- **essid** - The service set identifier that is attached to packets sent from neighboring devices.
- **apmac** - The physical layer address used to uniquely identify the APs.
- **channel** - The radio channel through which neighboring devices communicate with the SU-A-EZ.
- **freq** - The frequency on which neighboring devices are transmitting (this applies only for 20MHz bandwidth OFDM signals.)
- **rssi** - A measure of the signal strength received from neighboring devices.

Default Setting

None

Command Mode

Installer, Admin

Example 1

```
Installer# get BSSList
essid    apmac              channel  freq  rssi
-----------------------------------------------
linkutil  00:10:e7:c4:00:ab  148      5740  -73
linkutil  00:10:e7:e4:0c:6b  166      5830  -58
Installer#
```

Example 2

```
Installer# get BSSList apmac
apmac     00:10:e7:24:0d:9a
Installer#
```

5.9.13 set CStatus clear-cnt yes

This command sets all Rx/Tx statistics to a null value.

Syntax

set CStatus clear-cnt yes

Default Setting

None

Command Mode

Installer, Admin

Example

```
Installer# set CStatus clear-cnt yes
Installer#
```

5.9.14 get CStatus

This command displays the status of the wireless interface, as well as some Ethernet statistics.

Syntax

get CStatus

get CStatus <**essid** | **apmac** | **channel** | **freq** | **linkquality** | **rssi** | **noisefloor** | **txpower** | **linkstatus** | **rxpkt-wlan** | **rxbyte-wlan** | **txpkt-wlan** | **txbyte-wlan** | **rxpkt-eth** | **rxbyte-eth** | **txpkt-eth** | **txbyte-eth** | **iface**>

- **essid** - The service set identifier that is attached to packets sent from the SU-A-EZ.
- **apmac** - The physical layer address used to uniquely identify the AP.
- **channel** - The radio channel through which the SU-A-EZ communicates with the AP.
- **freq** - The portion of the 802.11a frequency band the SU-A-EZ is using.
- **linkquality** - A measurement of the quality of the signal received by the SU-A-EZ.
- **rssi** - A measure of the received signal strength indicator for the AP.
- **noisefloor** - A level of interference below which signals to and from the SU-A-EZ cannot be detected.
- **txpower** - A measure of the transmission signal power.
- **linkstatus** - A measure of activity on the link between the SU-A-EZ and associated AP.
- **rxpkt-wlan** - A measurement of the number of wireless packets received by the SU-A-EZ.
- **rxbyte-wlan** - A measurement of the number of wireless bytes received by the SU-A-EZ.
- **txpkt-wlan** - A measurement of the number of wireless packets transmitted by the SU-A-EZ.
- **txbyte-wlan** - A measurement of the number of wireless bytes transmitted by the SU-A-EZ.
- **rxpkt-eth** - A measurement of the number of packets received by the SU-A-EZ over the Ethernet port.

- **rxbyte-eth** - A measurement of the number of bytes received by the SU-A-EZ over the Ethernet port.
- **txpkt-eth** - A measurement of the number of packets transmitted by the SU-A-EZ over the Ethernet port.
- **txbyte-eth** - A measurement of the number of bytes transmitted by the SU-A-EZ over the Ethernet port.
- **iface** - The interface for which all the above data is displayed for.

Default Setting

None

Command Mode

Installer, Admin

Example 1

```
Installer# get CStatus
Property     Value
------------------------------
essid        ESSID1
apmac        00:00:00:00:00:00
channel      108
freq         5540
linkquality  0
rssi         -256
noisefloor   -256
txpower      Full
linkstatus   0
rxpkt-wlan   0
rxbyte-wlan  0
txpkt-wlan   0
txbyte-wlan  0
rxpkt-eth    1041
rxbyte-eth   105870
txpkt-eth    734
txbyte-eth   209723
iface        wlan0
Installer#
```

Example 2

```
Installer# get CStatus noisefloor
-256
Installer#
```

A

Appendix A - Troubleshooting

In This Chapter:

This appendix provides a lists of things to check in case of problems before contacting local Technical Support.

Check the following before you contact local Technical Support.

1. If the unit cannot access the network, check the following:
   - ◇ Be sure the SU-A-EZ is configured with the correct Service Set ID (SSID) for the network to which it is trying to connect.
   - ◇ If authentication or encryption are enabled, ensure that the SU-A-EZ is properly configured with the appropriate authentication or encryption keys.
2. If the SU-A-EZ cannot be configured using the Telnet, a web browser, or SNMP software:
   - ◇ Be sure that the SU-A-EZ has been configured with a valid IP address, subnet mask and default gateway.
   - ◇ If VLANs are enabled on the wired network, the VLAN tag on the SU-A-EZ should be set to the same tag as the management VLAN (default: no tag).
   - ◇ Check that you have a valid network connection to the SU-A-EZ.
   - ◇ If you are connecting to the SU-A-EZ through the wired Ethernet interface, check the network cabling between the management station and the SU-A-EZ. If you are connecting to SU-A-EZ from the wireless interface, ensure that you have a valid connection to the SU-A-EZ.
   - ◇ If you cannot connect using Telnet, you may have exceeded the maximum number of concurrent Telnet sessions permitted (i.e, four sessions). Try connecting again at a later time, or reboot the unit.
3. If you forgot or lost the password:
   - ◇ Use the "restore factory defaults" or "restore password" mechanism, then set the SU-A-EZ to its default configuration by powering off the device and rebooting. Then use the default user name and password for the mode you wish to access, admin or installer.
   - ◇ Otherwise, contact technical support.
4. If all other recovery measures fail, and the SU-A-EZ is still not functioning properly, reset the SU-A-EZ's hardware using the web interface, command line, or through a power reset.

Glossary

100BASE-TX
IEEE 802.3u specification for 100 Mbps Fast Ethernet over two pairs of Category 5 or better UTP cable.

10BASE-T
IEEE 802.3 specification for 10 Mbps Ethernet over two pairs of Category 3 or better UTP cable

Authentication
The process to verify the identity of a client requesting network access. IEEE 802.11 specifies two forms of authentication: open system and shared key.

Beacon
A signal periodically transmitted from the SU-A-EZ that is used to identify the service set, and to maintain contact with wireless clients.

Customer Premise Equipment (CPE)
Customer Premise Equipment: Communications equipment that resides on the customer's premises.

Dynamic Host Control Protocol (DHCP)
Dynamic Host Configuration Protocol: Provides a framework for passing configuration information to hosts on a TCP/IP network. DHCP is based on the Bootstrap Protocol (BOOTP), adding the capability of automatic allocation of reusable network addresses and additional configuration options.

Ethernet
A popular local area data communications network, which accepts transmission from computers and terminals.

Encryption
Data passing between the SU-A-EZ and clients can use encryption to protect from interception and evesdropping.

Extended Service Set (ESS)
Extended Service Set: More than one wireless cell can be configured with the same Service Set Identifier to allow mobile users can roam between different cells with the Extended Service Set.

File Transfer Protocol (FTP)
File Transfer Protocol: A TCP/IP protocol used for file transfer.

Hypertext Transfer Protocol (HTTP)
Hypertext Transfer Protocol: HTTP is a standard used to transmit and receive all data over the World Wide Web.

IEEE 802.11a

A wireless standard that supports high-speed communications in the 5 GHz band using Orthogonal Frequency Division Multiplexing (OFDM). The standard supports data rates of 6, 12, 24, and 54 Mbps.

Infrastructure

An integrated wireless and wired LAN is called an infrastructure configuration.

Local Area Network (LAN)

Local Area Network: A group of interconnected computer and support devices.

MAC

Media Access Control: The lower of the two sub-layers of the data link layer defined by the IEEE. The MAC sub-layer handles access to shared media, such as whether token passing or contention will be used.

MAC Address

Standardized data link layer address that is required for every port or device that connects to a LAN. Other devices in the network use these addresses to locate specific ports in the network and to create and update routing tables and data structures. MAC addresses are 6bytes long and are controlled by the IEEE.

Orthogonal Frequency Division Multiplexing (OFDM)

Orthogonal Frequency Division Multiplexing: OFDM allows multiple users to transmit in an allocated band by dividing the bandwidth into many narrow bandwidth carriers.

Open System

A security option for the SU-A-EZ which broadcasts a beacon signal including the configured SSID. Wireless clients can read the SSID from the beacon, and automatically reset their SSID to allow immediate connection to the nearest SU-A-EZ.

Power Over Ethernet (PoE)

Power over Ethernet: A specification for providing both power and data to low-power network devices using a single Category 5 Ethernet cable. PoE provides greater flexibility in the locating of Wi^{2}s and network devices, and significantly decreased installation costs.

RTS Threshold

Transmitters contending for the medium may not be aware of each other. RTS/CTS mechanism can solve this “Hidden Node Problem.” If the packet size is smaller than the preset RTS Threshold size, the RTS/CTS mechanism will NOT be enabled.

Service Set Identifier (SSID)

An identifier that is attached to packets sent over the wireless LAN and functions as a password for joining a particular radio cell; i.e., Basic Service Set (BSS).

Session Key
Session keys are unique to each client, and are used to authenticate a client connection, and correlate traffic passing between a specific client and the AU-EZ.

Shared Key
A shared key can be used to authenticate each client attached to a wireless network. Shared Key authentication must be used along with the 802.11 Wireless Equivalent Privacy algorithm.

Simple Network Management Protocol (SNMP)
Simple Network Management Protocol: The application protocol in the Internet suite of protocols which offers network management services.

Trivial File Transfer Protocol (TFTP)
Trivial File Transfer Protocol: A TCP/IP protocol commonly used for software downloads.

Virtual LAN (VLAN)
A Virtual LAN is a collection of network nodes that share the same collision domain regardless of their physical location or connection point in the network. A VLAN serves as a logical workgroup with no physical barriers, and allows users to share information and resources as though located on the same LAN.

Wired Equivalent Privacy (WEP)
Wired Equivalent Privacy: WEP is based on the use of security keys and the popular RC4 encryption algorithm. Wireless devices without a valid WEP key will be excluded from network traffic.

Wireless Client (SU-A-EZ)
A wireless client is a computer system that accesses a remote service on another computer (AP) by means of a wireless transmission signal.

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